planet to plate

the **Earth Hour** cookbook

60+ EARTH HOUR

Our major partner Bendigo Bank Bigger than a bank.

planettoplate

the **Earth Hour** cookbook

Earth Hour was launched in Sydney in 2007 as a campaign of WWF-Australia, with 2.2 million people and 2,100 businesses turning off their lights to show their support for action to tackle global warming.

Now Earth Hour is celebrated in more than 160 countries and 7,000 cities and towns worldwide. The symbolic hour has grown into the world's largest grassroots movement for the environment, with Earth Hour-inspired projects and initiatives – like this book – supported by WWF globally throughout the year.

This beautiful book celebrates Australia's wonderful fresh produce and the people who work so hard to produce it. It also highlights the need to solve climate change so future generations can enjoy the healthy food we have been so lucky to grow up with.

We have all the solutions we need to move away from generating electricity by burning coal and gas – fossil fuels that make global warming worse, leading to higher temperatures and more extreme weather events.

Instead, we can take advantage of Australia's abundant and affordable renewable energy sources. By switching to alternatives like solar and wind, we can cut carbon pollution and help protect the fresh food and farming communities that make our Aussie lifestyle so great.

We hope this collection of mouth-watering recipes and moving stories from farmers helps inspire you to live the spirit of Earth Hour, every hour, in your home, workplace and community.

No-one can do everything, but everyone can do something.

WWF

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When I was growing up I lived in an urban fringe area. One of the things I loved doing was going to neighbours' farms and feeding the cattle or helping with the hay-making in summer. That love of farming has stuck with me. I now have my own farm where I raise Belted Galloway and Angus cattle alongside thoroughbred horses.

Having the farm really highlights for me the connection between the city and rural areas and the reliance we all have on our farmers to produce food. And what a great job they do! Australian produce is used everywhere. When I travel for work I am always very proud to see it on the menus of fine restaurants in the great cities of the world.

However, to ensure we carry on this great tradition of Australian farming it is paramount we do all we can to ensure our environment can continue to produce top quality food.

Bendigo Bank has supported Earth Hour since it went global in 2008. Our partnership extends from branches across the country hosting lights-out events to a deeper commitment to reduce our impact on the environment and make positive changes to the way we operate. We want to make Australia a sustainable and healthier place for us all.

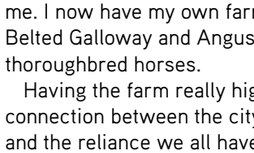
This *Planet to Plate* cookbook is a new chapter in the Earth Hour story, another world first for a home-grown movement now embraced by millions around the globe – and something we are pleased to have taken a bigger role in sponsoring.

The special focus of Australia's Earth Hour in 2015, drawing attention to the impact of climate change on local farmers and the fresh food they provide for millions of people both here and around the world, is particularly close to our heart.

When other banks moved out of regional and remote areas, we moved in. Our network of more than 300 locally owned Community Bank branches now stretches the length and breadth of Australia, from Dimbulah in Far North Queensland to Cygnet in Southern Tasmania. Our subsidiary Rural Bank is the only Australian-owned agribusiness-dedicated bank in the country.

Creating a strong Australia for the future means championing our farming communities. We are proud to stand by customers like Andrew Pauley, from Pingelly, Western Australia, who is one of the farmers featured in this book. Across this land thousands of farmers like him are grappling with the challenge of climate change while producing the food on which we all depend.

I hope the recipes and the story of food told in this book will inspire you, as it does me, to take more positive steps towards protecting our planet from the dangers of climate change. Together we can be part of something bigger and make a real difference.



Mike Hirst
Managing Director
Bendigo and Adelaide Bank

Our major partner

Bendigo Bank
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Waking up

Lynne Strong, Jamberoo, NSW

Food is the fabric of our society. As a sixth-generation farmer, I know farmers feel a massive responsibility to provide safe, affordable, nutritious food, and to look after the landscape. So much of what we do underpins health, wealth and happiness.

When I found out Earth Hour 2015 would celebrate Australian farmers and highlight the challenges they face, I was excited. As a farmer, I deal with declining natural resources and the impact of extreme weather on a day-to-day basis. I know how important it is to accept the challenge of climate change and respond.

Climate change is one of the top pressures facing farmers. If we let it continue, people's access to a choice of food will dwindle. People's access to affordable food will decline. This is what we have to wake up to.

Our cows supply 50,000 Australians every day with milk for their breakfast. Our cows are part of the family, so we do everything we can to give them the best life possible. This has become more challenging over the past 30 years with increasing extreme weather events. It's not unusual during high heat events for cows to reduce their milk supply by up to 10 per cent. Heat stresses them, so it's absolutely pivotal to manage them carefully and make sure they get shade and access to plentiful supplies of fresh water.

I have so much passion for taking agriculture beyond the farm gate. I believe, right now, there's not enough recognition of the challenges modern farmers face. Farmers have traditionally been quiet achievers. More than ever we need to share our journey with the community.

It's about having conversations. I'm helping farmers to do this through initiatives such as Art4Agriculture, the Young Farming Champions and Young Eco Champions and the Archibull Prize. The young people involved are successfully connecting with the community, sharing their values and building relationships with consumers. We're engaging in conversations on climate change, food wastage and the challenges of producing safe, affordable and nutritious food with a declining resource base.

I think this cookbook is a fantastic opportunity for the broader community to meet some of our wonderful Australian farmers, share their stories and start thinking about food and how they value it in a different way.

I hope the farming community's partnership with Earth Hour will help to raise awareness of the challenges we face. I hope it will create an impetus for the community and farmers to work together to map out a brighter future. If we're going to address climate change and ensure food security, agriculture has to be a partnership between farmers and the whole community.

CEREALS, NUTS AND LEGUMES

Almonds and global warming

Almonds are a perennial nut crop native to Mediterranean climates characterised by warm, dry summers and mild, wet winters. As a temperate nut, almonds require winter chilling to flower in the spring. Restricted winter chilling due to a warming climate is likely to delay flowering until later in spring, when high temperatures will restrict pollination and fruit set. Almond plants can also lose significant amounts of water at night, which will be exacerbated by higher night-time temperatures, negatively affecting the quality and quantity of production.

CAN-DO muesli

This is my variation on the all-star CADA breakfast using coconut, apple, dates and almonds. The best way to describe it is as a kind of instant oat-free muesli. My version, CAN-DO, uses coconut, apple, nuts, dates and orange. The difference is that almonds (or other nuts) are soaked in orange juice, which softens them and adds extra flavour and zing to the muesli. Soaking the nuts overnight means that breakfast is just a minute away.

Serves 1
Prep time 1 minute plus time to soak

Ingredients

- 50 g almonds, pistachio kernels or cashews
- 1 orange, juiced
- 100 g apple, cut in large pieces
- 30 g pitted dates
- 20 g desiccated coconut
- yoghurt of your choice, to serve
- blueberries or other fruit, to serve

Method

Soak your chosen nuts in orange juice for at least 30 minutes, or leave overnight. Drain off the orange juice (drink, if desired).

Place the soaked nuts, apple, dates and desiccated coconut in a food processor bowl. Chop for 2 seconds on high speed. Scrape down bowl and chop for another second if you desire a finer consistency.

Serve with yoghurt and blueberries

Dani Valent

Dani Valent is an award-winning writer with a particular interest in food. Her reviews and articles, including profiles of renowned chefs such as Heston Blumenthal and Yotam Ottolenghi, have appeared in *The Age*, *Gourmet Traveller* and other publications. Her two cookbooks, *In the Mix: Great Thermomix Recipes* and *In the Mix 2: More Great Thermomix Recipes*, have won Gourmand World Cookbook Awards.

World's simplest bread and butter

This bread recipe, given to me by my friend Kareen in Perth, is brilliant because it takes minimal time, requires no kneading and gives you the sort of result that draws murmurs of approval from all who taste it. Pure genius! Make it and be amazed.

Makes 1 large loaf and 6 rolls
Prep time 2 hours and overnight in fridge

Ingredients

- 1 kg bread flour, plus extra to dust
- 1 tbsp dry yeast
- 1½ tbsp salt flakes
- 950 ml lukewarm water

Butter

- 300 ml cream
- 300 ml sour cream
  iced water
- salt flakes, to taste

Method

In a large bowl, combine the flour and yeast. Mix in salt and water until well combined. Cover with cling wrap then refrigerate overnight. Note: this is a really wet dough.

Remove the bowl from the fridge 1 hour prior to cooking and let it to come to room temperature. Preheat the oven to 220˚C. Line 2 baking trays with baking paper and generously dust them with flour.

On one tray, shape half the dough into a rough 30 cm log. Bake in oven for 1 hour until it looks golden and sounds hollow when you knock on the base with your knuckles.

Make 6 small rolls with the remaining dough. You'll note that form has a profound impact on openness of the crumb. The larger loaf will be denser and its crumb a lot less elastic than the rolls. Bake the rolls for about 40 minutes, or until they are golden and sound hollow when you tap them.

To make the butter, place cream and sour cream into a bowl. Whisk until the butter fat starts to coagulate and the mixture splits – this is happening when you see the yellow fat separating out from the blue-white buttermilk.

Pour off the buttermilk into a separate container. You can use it later for baking; it is especially good in scones or for soaking chicken before crumbing for deep-frying, southern-style.

Keep whisking and more buttermilk will appear. Drain this off and keep going until the globules of butter fat are nuggets the size of popcorn.

Tip the nuggets into a colander placed over a bowl to catch the last of the buttermilk. Remove that bowl and pour iced water over the butter in the colander to rinse off any excess whey. To help this happen, massage the butter under the flow of icy water. Note that temperature is important; in warm water the butter would just melt away.

Transfer your new butter to a sheet of baking paper, season with salt and roll into a log. Keep in the fridge until needed. Serve the butter slathered on the warm bread.

Matt Preston

Matt is an award-winning food journalist, restaurant critic and television personality. His weekly food column appears nationwide in *The Courier Mail*, *The Daily Telegraph*, *Herald Sun*, *The Advertiser* and *Sunday Times*. Best known as a judge and co-host of *MasterChef Australia*, he is also a senior editor for *Delicious* and *Taste* magazines.

Wheat and global warming

Wheat growing is strongly affected by rainfall and temperature. Future projections indicate lower and more variable production and increasing proportions of grain of low dietary value. While higher levels of carbon-dioxide in the atmosphere will increase plant growth, termed the "fertilisation effect", this extra growth requires more nitrogen and can reduce baking quality with lower levels of protein and important micronutrients. Zinc and iron concentrations, for example, are projected to be 5-10 per cent lower mid-century, adding to the already significant pressure of disease associated with malnutrition.

> I think farming is becoming far more risky. There are so many things that can go wrong.

Wheat

Mike McFarlane, Doodlakine, WA

We're in the central wheatbelt of Western Australia, about 200 km east of Perth, and grow predominantly cereals, some pulse crops, a little bit of oil seed and we run Merino sheep. My son, my wife and I collectively work 4,000 hectares of land. We rely on one another.

It's an export state over here in Western Australia. We produce more food than we have the population to consume. In our case, the majority goes to Asia. A fair bit of the wheat goes to make noodles in Japan, Korea and Taiwan. A large part of the wool goes to China.

My stepfather's family cleared the land from the very beginning; it has been developed here now for 105 years.

I'm 65 and I've been on this farm 58 years. I didn't have a feel for any other career in life. I just liked the land and I wasn't going to move. I guess the key was we had three good seasons when I started off. If I'd had three bad seasons I wouldn't be farming.

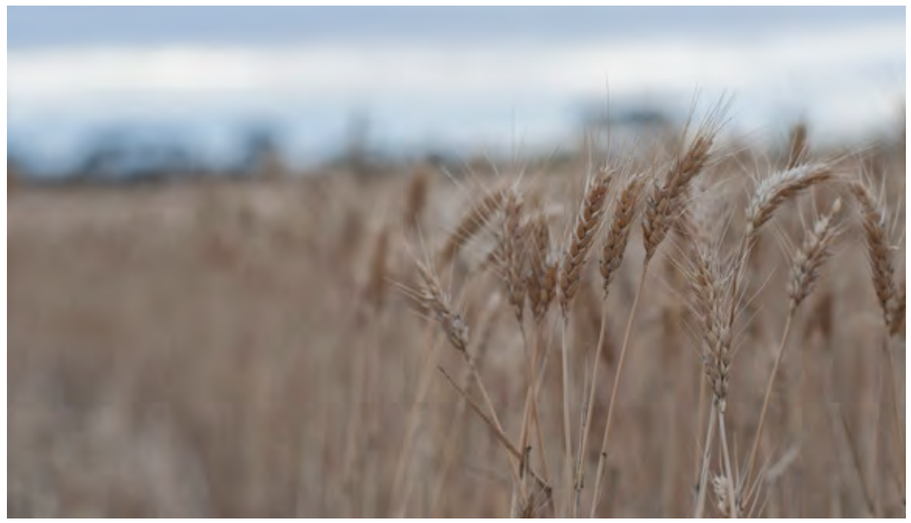
We farm in a semi-arid area, with only about 320 mm of rain a year. We don't have irrigation so we very much rely on winter rainfall to grow crops. Winter rain soaks into the ground a lot more and maintains the vegetation a lot better.

In my lifetime, we've experienced a general drying of that winter rain. We seem to be getting less and less during the growing period. These days you look at the calendar rather than the rain gauge. You have to start seeding even if it's dry as anything. You know that every drop of rain that falls has to work towards growing the actual plant. It is quite different to when I was a kid.

Early last century our farm suffered greatly from the rabbit plague. A lot of vegetation was cleared to destroy the rabbit habitats. I always wondered why it was done so severely.

My wife and I, with the help of our son, have been regenerating large parts of the farm that were unviable. We've seen a lot of nature come back onto the property. It gives you a big buzz to see that. But then you see the dry years that make all your efforts look a bit shabby. But that's life. There are good times and bad times.

It is quite a challenge out here. I think farming is becoming far more risky. There are just so many things that can go wrong. You've just got to be ahead of the game; we need to really put our efforts into adaptation, and fast.



Potato and rye bread

This is a traditional Finnish bread, combining the humble ingredients of potato, rye and molasses.

Makes 4 loaves
Prep time 3 days

Ingredients

- 2 Desiree potatoes, medium-sized
- 200 g rye flour
- ½ litre of potato cooking water (from boiled potato water)
- 1.2 kg bakers flour
- 500 g sourdough starter
- 400 g rye flour
- 550 ml warm water
- 12.5 g fresh yeast, or 6.5 g of dry yeast
- 100 g molasses
- 50 ml vegetable oil
- 26 g salt
- 25 g caraway seeds

Day 1: Boil the potatoes in unsalted water. Once the potatoes are tender, peel, pass through a sieve, then mix in a bowl with the potato cooking water. Mix in 200 g of rye flour. Cover bowl with cling wrap and leave at room temperature to ferment overnight.

Day 2: Mix fresh or dry yeast with the warm water. Add the potato starter from the previous day and the sourdough starter. Leave on the bench for 30 minutes at room temperature.

Add molasses, vegetable oil, salt and caraway seeds into the mix, then mix in the rye flour and bakers flour. Mix the dough for 8 minutes then cover bowl with cling wrap and let it rise at room temperature for 3 hours.

Place in the fridge for a further 3 hours.

Remove the dough and divide into 4 batches of about 500 g. Shape into loaves and place onto a tray lined with baking paper, cover with cling wrap and leave in the fridge overnight to ferment.

Day 3: Take the loaves from the fridge. Let them proof at room temperature for about 3-4 hours, until they double in size.

Once proofed, heat oven to 250˚C. Place loaves in the hot oven, reduce the temperature to 230˚C and bake for 20 minutes, then reduce temperature to 150˚C and bake for a further 10 minutes.

Remove loaves from oven and brush with molasses glaze. The glaze can be made on any day and stored in the fridge. Mix 200 g of molasses and 200 g of water, bring to the boil and allow to cool.

Once glazed, let loaves cool on wire racks.

Pasi Petanen

Finnish-born Pasi Petanen was head chef for eight years at Mark Best's three-hatted Marque Restaurant in Sydney before venturing out on his own with his pop-up restaurant Cafe Paci. Pasi's distinctive cooking approach is characterised by a consistent style with new twists along the way.

Canola and global warming

Canola is a bright, yellow-flowering plant that in the past 40 years has become one of the most important crops for making vegetable oil. Canola oil is classified as being cardio-protective because of its substantial amounts of essential unsaturated fatty acids but low amounts of saturated fatty acids. Increased carbon-dioxide levels in the atmosphere predicted by mid-century will diminish canola oil's health benefits, reducing the level of healthier unsaturated fatty acids by about 2-3 per cent while the level of unhealthier saturated fatty acids will remain the same.

Corn and global warming

Maize, better known as corn, is one of the big three global cereal crops along with wheat and rice. Higher temperatures may increase maize yields in temperate areas but reduce them in many tropical areas where temperatures exceed 35°C. In Australia more than half of total production comes from rainfed agriculture, where yields are highly variable and increasingly affected by drought and extreme heat. Likewise, irrigated maize faces increasing competition for water. Further development of varieties and management techniques might help reduce future yield losses but only if they take into account likely future climate conditions.

Corn fritters with avocado salsa

Corn kernels are an amazing natural sweetener. High in many essential vitamins, they offer a great burst of flavour to any dish. This is the perfect summer breakfast: healthy, colourful and naturally balanced.

Serves 5
Prep time 15 minutes

Ingredients

- 1 sweet corn cob, kernels removed
- 2 eggs
- ½ handful chives, sliced
- pinch of salt
- 150 g almond meal
- 245 ml almond milk, or regular milk
- 2 tbsp olive oil
- 1 Spanish onion, roughly chopped
- 1 tomato, roughly chopped
- ½ handful coriander leaves, roughly chopped
- 1 cucumber, roughly chopped
- ½ lemon, juiced
- 2 tbsp pepitas, pounded in mortar and pestle
- ½ long red chilli, seeds removed, finely chopped
- 1 avocado, diced

Method

In a bowl, combine the almond meal, onion, eggs, salt, milk and corn.

Heat a frying pan to high heat and add the oil. Using a spoon, shape the corn mix into 15 patties. Cook each side for 2 minutes or until golden brown and cooked through.

Remove and set aside on a plate until all fritters are cooked.

In a separate bowl, combine Spanish onion, tomato, cucumber, coriander leaves, avocado and chilli. Just before serving, squeeze over some lemon juice and mix through.

To serve, stack three fritters on top of each other, sandwiching the avocado salsa between each, and finish with a sprinkle of pepitas.

Alternatively you can serve the fritters individually with a spoonful of avocado salsa on each.

Daniel Churchill

Daniel is a cook, author, personal trainer and speaker. Since appearing as a contestant on *MasterChef Australia* in 2013, he has gained an international profile through a worldwide book deal with Simon & Schuster and a TV series filmed in the United States. Daniel's first book, *The Healthy Cook*, was published in 2014 and a follow-up, *Dude Food*, will be published in 2015.

> The time available to grow a crop is getting shorter. It's getting worse at a rate I wouldn't have thought possible.

Canola

Peter Holding, Harden, NSW

We farm crops, mainly canola and wheat, with some variations of lupins or barley. We also run sheep for wool, mainly Merinos. At times we use white suffolk rams over them to produce lambs for meat production.

I'm the third generation on this farm and my son James will be the fourth. We've always lived here; it's all family-run. The house that I live in was my grandfather's house. Dad still lives on this farm but he and Mum are retired now; they mostly just check stock and do other monitoring. It's myself and James doing most of the work.

When I left school, I went to Sydney and did a couple of years of accounting. I decided I didn't really like the city much, so I went to Wagga Agricultural College and did a degree in agricultural science. I think it's important to have a good education in farming. James has a degree in rural science from the University of New England and worked at CSIRO for a number of years. A lot of the urban community seems to think farming is relatively easy to do, but it's quite a complicated business. There's so much market pressure and issues around finance, genetics, soils and climate change.

The Harden region was previously regarded as a high-rainfall area. We used to get an average 50 mm of rain a month and that made it relatively simple to farm. Now we're getting dry autumns and you can't get the crops without careful moisture conservation. We're getting extremely cold winters where we get hit with frost; we got down to -5°C in 2014. It wiped out a lot. To adapt we baled up 100 hectares of frost-damaged crop and sold it on as hay to dairy farmers on the coast. We've never made hay in the past.

Change is definitely happening and it's happening now. The time available to grow a crop is getting shorter. As that happens, you get less and less yield. It's getting worse, at a rate I wouldn't have thought possible.

If you like what you're eating, wake up and have a look around. You might not be eating it for very much longer. I think there will be a devastating impact on food prices. Change is going to be forced upon us and we're going to have to get used to it.

I don't think climate change poses an unanswerable question. We just have to start working on the problem instead of hoping it goes away. It's a small-person movement as well as a government one. The answer is in every person doing their own little bit. If we all do that, then I think we'll get there.

Spiced Moroccan chickpeas

Chickpeas are a healthy addition to a meal, and these ones, spiced with Moroccan flavours, are decidedly more-ish. Serve on their own as a light meal, or as an accompaniment to a large feast. These spiced chickpeas are a perfect match for gloriously sticky orange-infused lamb shanks.

Serves 6
Prep time 40 minutes, and overnight to soak chickpeas

Ingredients

- 425 g dried chickpeas, soaked overnight
- 400 g tin cherry tomatoes
- 3 tbsp extra virgin olive oil, plus extra
- 1 eggplant, cut into 2 cm pieces
- 1 onion, chopped
- 2 celery stalks, chopped
- 1 tsp cumin
- 1 tsp ground coriander
- 2 cm piece fresh turmeric, peeled and finely grated (or 1 tsp ground)
- 1 tsp ground cinnamon
- Greek yoghurt, to serve
- 1 lemon
- ½ bunch coriander, chopped, to serve

Method

Wash soaked chickpeas well and place in a saucepan, discarding any discoloured chickpeas. Cover with cold water and simmer over medium heat for 65-90 minutes, depending on soaking time, until tender.

Heat oil in a deep-sided frying pan over a medium-high heat and cook eggplant until just golden, turning regularly with tongs. Transfer to a plate.

Using the same pan, sauté onion and celery for 5-8 minutes, until soft and translucent. Add spices and cook until fragrant for a further 1-2 minutes.

Add the cooked chickpeas, tomatoes and eggplant, bring to a gentle simmer for about 12-15 minutes, until eggplant is cooked, adding more oil as needed. Then transfer to a serving bowl.

Meanwhile, in a small bowl, combine yoghurt and the juice from half a lemon and season with sea salt and freshly ground black pepper. Drizzle over chickpeas and scatter over coriander to serve.

Serve with grilled flatbread and lemon wedges.

Kate Gibbs

Kate is a journalist, food writer and author. She writes a food trends column for *Sunday Style* magazine and contributes regularly to a range of newspapers and magazines. She has authored two cookbooks, *The Thrifty Kitchen* and *After Toast*, and a memoir called *Margaret & Me*, covering food stories from her own life and that of her grandmother, cooking legend Margaret Fulton.

Chickpeas and global warming

Chickpeas are grown from northern Western Australia to Mediterranean-climate regions in the south, sub-tropical southern Queensland and more recently in eastern Australia. Climate changes are expected to bring more drought, heat and cold weather events in different climatic zones. Heat stress (35˚C or above) during flowering and pod setting leads to flower drop, reduced pod and seed set, and consequent yield loss, especially in eastern Australia. Frost (below 0˚C) and cold (below 10˚C) also reduce the yield of winter-sown chickpeas, due to damage to flowers, reduced early pod formation and seed filling.

Fennel and pea risotto

One of the greatest dinner parties I ever had involved a simple risotto. It is the perfect spring dish using fresh seasonal produce. Once you have a good risotto base you can add all sorts of different ingredients like beetroot, chicken and those forgotten veggies in the back of the fridge. This dish is best served with good-quality fresh parmesan and a chilled glass of white wine.

Serves 4
Prep time 50 minutes

Ingredients

- 1 tbsp butter
- 1 tbsp extra-virgin olive oil
- 1 onion, peeled and finely chopped
- 400 g Arborio rice
- 250 ml white wine
- 1 litre chicken or vegetable stock
- sea salt
- freshly ground black pepper

Extras

- 1 fennel bulb, finely sliced
- 225 g frozen peas
- fennel tops, roughly chopped
- 50 g grated parmesan

Method

For the base, heat the butter and olive oil together in a large heavy-bottomed pan over medium heat. Add the onion and cook until soft. Meanwhile, heat the stock.

Add the rice to the pan and stir for a minute or two until well-coated with the oil and butter. Add the wine and stir until it has been absorbed.

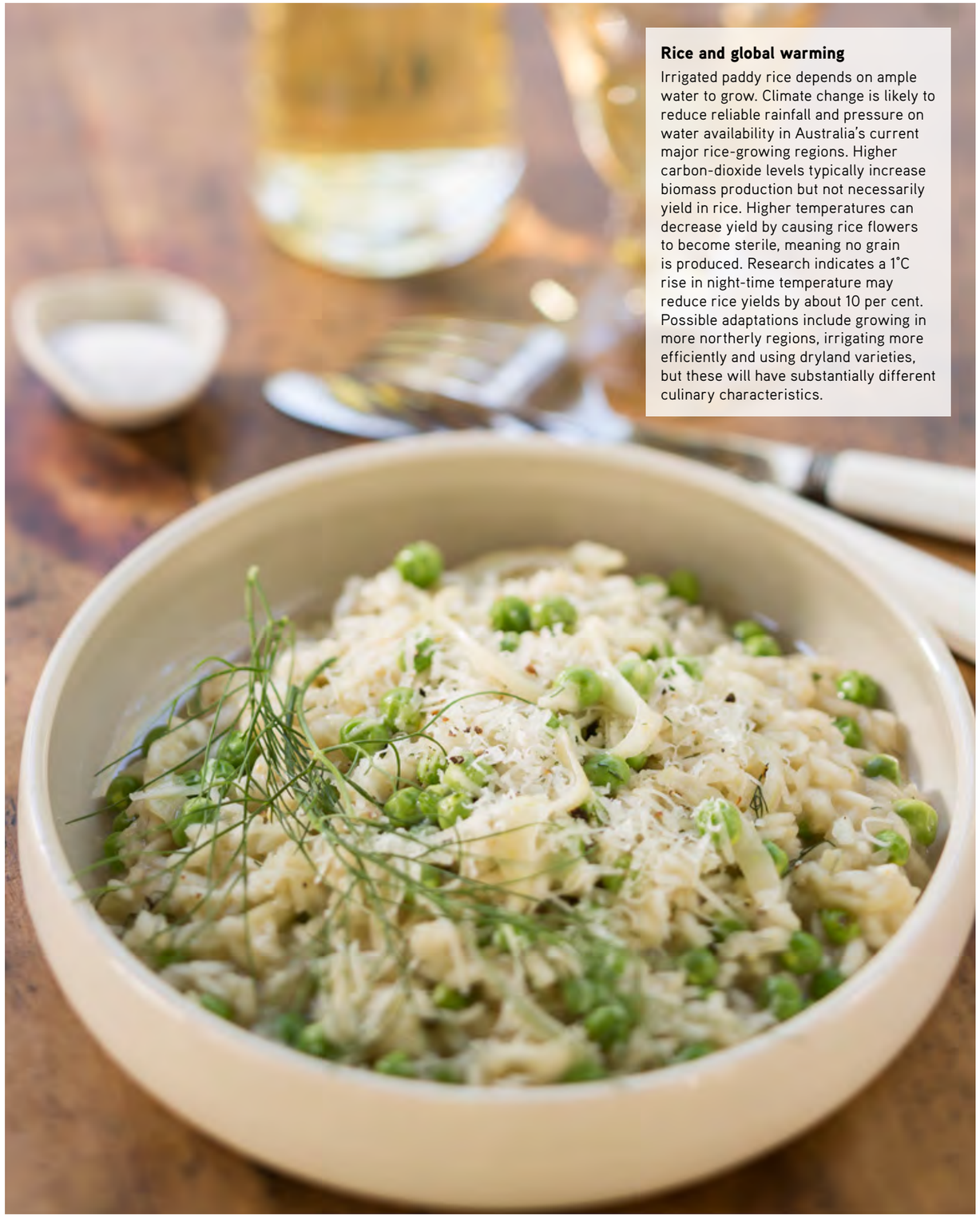
Begin adding the hot stock, a ladleful or two at a time. With each addition of stock, stir steadily and constantly until the liquid is absorbed. Keep adding the stock gradually and stir constantly until the rice is plump and creamy, cooked but still slightly al dente. This should take about 20-25 minutes. Season to taste.

After about 15-20 minutes of stirring the base (5 minutes before it is ready) add the fennel, peas and fennel tops. Continue stirring and adding stock until the rice is al dente.

Just before serving, stir through the parmesan.

Luke Mangan

Luke is highly regarded internationally as a shining exemplar of Australia's culinary culture. In addition to running 11 busy restaurants, he is also consulting chef for Virgin Australia. He has published five cookbooks as well as his autobiography, has launched his own range of gourmet products and makes regular TV appearances.



Rice and global warming

Irrigated paddy rice depends on ample water to grow. Climate change is likely to reduce reliable rainfall and pressure on water availability in Australia's current major rice-growing regions. Higher carbon-dioxide levels typically increase biomass production but not necessarily yield in rice. Higher temperatures can decrease yield by causing rice flowers to become sterile, meaning no grain is produced. Research indicates a 1°C rise in night-time temperature may reduce rice yields by about 10 per cent. Possible adaptations include growing in more northerly regions, irrigating more efficiently and using dryland varieties, but these will have substantially different culinary characteristics.

> We only have the one growing season here, in the winter, and that's very short now.

Barley

Andrew Pauley, Pingelly, WA

I'm the third generation on this farm and I've farmed here for 30 years; I still live in the same farmhouse I grew up in. I always enjoyed farming as a kid and I never really gave any thought to doing anything else.

That said, I suppose my passion for it didn't really hit until I was in my late twenties. The catalyst was that I could see things changing on the farm. When I was growing up, we were definitely having a lot of wetter years and farming was easier in a way. Within 10 years of taking on the farm I could see subtle land changes with things like weed pressure and soil structure depletion. That started me researching and talking to people who could give me direction.

I started off substituting some of the chemical fertilisers for natural fertilisers. That then ballooned into distributing those products and helping other farmers do the same thing. I now have my own soil and nutrition consulting business, where I travel through the wheatbelt advising other farmers. Our greatest asset is our soil. We have to look after that.

We're a traditional mixed farm, with a 50/50 split between grain and livestock. The majority of my crop is feed grains – oats and barley used for domestic livestock. Our lambs go to the domestic meat market.

Growing up, we had wet winters and dry, hot summers. Now we seem to be getting tropical summers and mild winters. We're getting less winter rainfall and more summer rainfall. We only have the one growing season here, in the winter, and that can be very short now.

I simply get on with the fact that things are changing, and as producers we have to make sure we look after the land for our next generation. If we don't do something now, our soils will only become more depleted, our systems will change and our food production will eventually decrease.

My wife Megan and I have two boys. Right now, neither will pursue agriculture as their future. They've got their own passions, and that's fantastic, but it does leave the family farm in question when I decide to hang up my work boots. I've often driven around the paddocks thinking about who will farm this land next. I could throw my hands up and say: "Bugger it, what's the point of looking after the soil when the next bloke who comes along will probably go back to the old ways?"

But if I can keep educating people, this farm will keep the nutrient production and soil health I've started. That'll keep going through someone else's farming generation. That's all I could wish for.

Barley and global warming

Climate change has several key effects on barley. More atmospheric carbon-dioxide increases yields of crops such as barley by about 0.2 per cent a year (but may lead to reduced grain protein). Hotter temperatures will lower yields. It is predicted that by mid-century these two factors will largely cancel each other out, leading to net declines in both yield and quality. There remains uncertainty about how global warming will affect rainfall but the risk appears to be for less rain, and hence lower grain yields, across southern Australia's cropping belt, although small increases in some areas are possible.

Chopped tomato, barley, almond and sumac salad

This is a great salad on its own, garnished with fetta, or with any grilled meat straight off the barbecue. The better the tomatoes, the better the salad.

Serves 4
Prep time 35 minutes

Ingredients

- 8 ripe tomatoes, assorted types
- 500 g pearl barley
- 1 bunch flat leaf parsley
- 100 g blanched almonds
- 2 tbsp sumac
- 125 ml tomato sugo
- 125 ml red wine vinegar
- 65 g pomegranate molasses
- 2 cloves garlic, fine diced
- ½ tsp cumin seeds
- 1 lemon, juiced
- 250 ml extra-virgin olive oil
- salt and pepper to season

Method

To cook the pearl barley, place 250 g in 500 ml of cold water, simmer for 30 minutes then drain.

Make the dressing for the salad by combining the tomato sugo (home-made is best, or you can drain some chunky chopped tinned tomato and use that), red wine vinegar, pomegranate molasses, garlic, lemon juice, and extra-virgin olive oil in a large bowl using a whisk.

Add the cumin after lightly toasting the seeds in a pan and grinding them in a mortar with a pestle. Set the dressing aside.

Lightly roast the almonds. Roughly chop the tomatoes, parsley and almonds, then add to a large bowl with the cooked pearl barley.

Pour the dressing over the tomato salad mix and season with the sumac, salt and pepper. Serve immediately.

Nicky Riemer

Nicky Riemer began her career under the guidance of Stephanie Alexander before graduating to head chef roles at a range of Melbourne dining destinations as well as executive chef of H One in Hong Kong. With a deep passion for local produce and a love of traditional cooking techniques, Nicky is the proud co-owner and head chef of Union Dining in Richmond, Melbourne.

Lentil and celeriac salad

The inspiration for this recipe comes from Yotam Ottolenghi's amazing book *Plenty*. It's such a great side during cooler weather and goes particularly well with barbecued venison steaks – but, to be honest, what doesn't?

Serves 4
Prep time 15 minutes

Ingredients

- 200 g green 'Puy' style lentils
- 1 large celeriac
- 85 g slivered almonds
- 1 bunch baby eschallots or spring onions
- 15 g parsley

Dressing

- 4 tbsp extra virgin olive oil
- 1 tbsp Dijon mustard
- 2 tbsp apple cider vinegar
- ½ tsp brown sugar

Method

Place lentils and two cups of water in a large saucepan and bring to the boil. Reduce heat and cook for 15 minutes or until the lentils are tender but still keep their shape.

Meanwhile, peel, trim and cut celeriac into 1 cm thick batons. Finely chop eschallots and parsley. Lightly toast almonds.

Cook celeriac in a pot of salted boiling water for about 10 minutes or until al dente.

Drain and toss with the lentils. Add the almonds, eschallots and parsley.

Whisk together the dressing ingredients then gently toss with the lentil salad to combine.

Serve warm or at room temperature.

Sophie Hansen

Sophie is a food writer and deer farmer from Orange, NSW. Her blog and book, *Local is Lovely*, celebrates seasonal produce and the farmers and producers behind it. She has worked in Italy for Slow Food International's editorial house and freelanced for some of Australia's top lifestyle magazines and websites.

Lentils and global warming

Lentils are the world's oldest known food crop. In Australia they are a high-value annual winter legume mainly grown in Victoria and South Australia. Climate changes have already affected yields throughout lentil-growing areas largely due to drought, frost and diseases. Drought limits lentil seed yield as low soil moisture and high temperatures during reproduction and pod filling leads to poor seed set and later pod cracking.

> The most spectacular effect of climate change on us is the impending demise of our main crop.

Pistachios

Graham and Annemarie Brookman, Gawler, SA

I trained as a horticulturalist at Roseworthy Agricultural College, north of Adelaide. After I finished there, I was taken off to military activity. I happened to end up wandering through the jungles of Malaysia, and it really struck me that the nature of their agricultural system, as it was back in those days, was much more sustainable than the sort of agriculture I'd been taught in South Australia.

After that, a friend and I travelled overseas to look at land-use systems around the world. We ended up going through 30 different countries. On the way I met Annemarie in Holland and she joined us for part of the trip.

When we got back to Australia, we immediately wanted to get a bit of land and try to create a sustainable agricultural system. It was only a few years before we encountered permaculture as a land-use system. It was actually dreamed up in Tasmania; we'd been all the way round the world and it was in our backyard the whole time.

So we kicked off our permaculture plan and have been hammering away at it ever since. We've managed to buy adjoining farms to intensify the operation and make it financially viable as well as environmentally sustainable.

We grow more than 160 varieties of nuts, fruits and vegetables which we sell throughout the year at the Adelaide Showground Farmers Market and at organic retailers. In addition to farming, we run a whole range of educational workshops on organic growing and permaculture. We get a lot of school kids, university students and interest groups coming here on farm tours.

The most spectacular effect of climate change on us is the impending demise of our main crop. Pistachios require a certain amount of chill during the winter to flower in spring. Last year we were down to 15 per cent of the potential crop because we simply had too warm a winter. That was the second failure in four years. Basically it's just destroying the enterprise – and relatively quickly.

We've been decapitating a lot of pistachio trees so we can graft to a different cultivar that doesn't require so much winter chill. That's a direct adaption to climate change. We've also found that through a range of warm summers some of our apples simply didn't survive. We're no longer replacing these crops with more apples but heat-tolerant species like pomegranate, Chinese dates, figs and carob.

There's a whole lot of other tricks that we use, like actually spraying sunscreen onto plants, but of course a measure like that can only be successful for a short while in the face of rampant climate change. We've had to go all the way towards changing species.

Walnuts and global warming

Walnuts are a perennial nut crop native to Mediterranean climates with warm, dry summers and mild, wet winters. They are grown commercially in Tasmania, Victoria and NSW, with smaller orchards located in South Australia and south-west Western Australia. As with other temperate nut crops, walnuts require winter chilling to flower in late spring. Global warming will affect winter chilling, resulting in late and erratic flowering. High temperatures at flowering and fruit set, together with potentially restricted supplies of irrigation water, make walnuts particularly vulnerable to future conditions.

Ravioli Genovese

This dish is typical of Genoa, with a beautiful rustic feel just like the port city it originates from. The walnut pesto is an alternative to another pesto of basil, pine nut, parmesan and garlic. In fact, pesto refers to any crushed dressing of herbs, usually with parmesan and some sort of nut, used to dress pasta. This ravioli uses walnut, parmesan, garlic and marjoram. The nutty and creamy dressing coats the pasta parcels that are filled with peppery rocket leaf and mascarpone.

Serves 4
Prep time 2 hours

Ingredients

500 g Eden Valley Biodynamic pasta flour
25 yolks from 60 g free-range eggs
150 g fresh ricotta
60 g mascarpone
250 g large leaf rocket leaves
1 lemon, zested
½ tsp nutmeg, grated
30 g Reggiano Parmigiano, grated
salt and pepper

Walnut Pesto

75 g walnuts
85 g cream
¼ garlic clove
1 tbsp extra-virgin olive oil
2 tbsp grated parmesan
1 tbsp marjoram leaves, chopped
salt and pepper

Other

100 g unsalted butter, cut into small pieces
50 g Reggiano Parmigiano, crumbled
20 chive flowers (not bunch) to garnish

Method

For the pasta filling, heat large pans with some olive oil and quickly sauté the rocket leaves until wilted. Remove from pans and spread onto perforated trays to drain and cool. Run your knife through the rocket so there are no long stringy bits.

Place the ricotta and mascarpone into a blender and blend until smooth, place into a large bowl and mix in the rocket. Season with lemon zest, nutmeg, Reggiano, salt and pepper.

For the dough, place all the ingredients into a mixing bowl with a dough hook attachment and mix on slow speed until dough has formed. Wrap in cling wrap and leave to rest in fridge for 1 hour.

Fold in a pasta machine and continue to roll and fold the pasta through the machine many times to “laminate” the pasta. Roll out the dough to about 2 mm in thickness and cut into 8 x 8 cm squares. Place 15 g of filling in the centre of each square of pasta, brush a little water around the edges (just enough so the pasta sticks to itself) and fold to make a triangle. Place the finished raviolis into trays heavily dusted with durum semolina so they do not stick. Make sure the raviolis do not touch each other.

For the pesto, blend the walnuts and garlic together until finely chopped. Add the cream, oil and parmesan and blend in. Season with salt, pepper and marjoram.

To assemble, bring a large pot of salted water to the boil. Melt the butter in gastronome trays and keep warm. Cook the ravioli in the boiling water for 4-5 minutes, then remove from the water, divide into buttered gastronome trays and toss through seasoning with a little salt.

Spread a tablespoon of the walnut pesto onto each plate. Arrange 3 ravioli half-sitting on the walnut pesto, sprinkle some crumbled Reggiano Parmigiano over the pasta and garnish with 5 chive flowers per serve.

Guy Grossi

Guy is head chef and owner of Melbourne restaurants including Grossi Florentino, Merchant Osteria Veneta and Ombra Salumi Bar. His passions lie in cooking and sourcing pure ingredients produced in artisan style to maximise the integrity of his dishes. His books include *Recipes From My Mother’s Kitchen*, *My Italian Heart* and *Love Italy*. He is a dedicated philanthropist and mentor.

Mixed leaves and beans salad with caramelised pecans

This is a really easy and delicious salad with a spicy crunch factor that can be quickly assembled when the cupboard is bare. For this salad I have used some flavoursome leaves – Mizuna, Mache Frisee, Baby Red Sorrel, Pea Tendrils and Tatsoi – and a variety of alfalfa and snowpea sprouts. You can use red lentil beans or just the wonderful edamame beans that can be podded pretty much straight from your freezer.

Serves 6
Prep time 15 minutes

Ingredients

600 g mixed leaves, washed and dried
180 g of mixed sprout beans
100 g edamame beans, podded
1 tbsp toasted almond slithers
140 g caramelised pecans

Caramelised pecans

240 g pecans, or any preferred nuts, shelled
2 tbsp caster sugar
2 tbsp light soy sauce
1 tbsp olive oil
1 tsp hot chilli flakes

Dressing

165 ml good-quality olive oil
½ tsp sesame oil
2 tbsp good-quality balsamic vinegar
2 cloves garlic, crushed
1 tbsp Dijon mustard
sea salt and ground black pepper, to taste

Method

To make the caramelised pecans, heat a small saucepan over a medium heat. After 1 minute toss in the nuts, stirring continually to allow them to heat through. After a couple of minutes sprinkle the sugar over the nuts and allow to caramelise. Carefully pour in the soy sauce and keep stirring, followed by the oil and chilli flakes.

When the nuts are well-coated and sticky, remove from pan to a plate to cool and set aside. The nuts will harden when cold. Note: the nuts can be prepared in advance and stored in an airtight container for 24 hours.

While the nuts are cooling, quickly mix all the dressing ingredients in a glass jar with a tight-fitting lid. Shake well to combine. Set aside. Note: the dressing can also be made in advance and stored in the fridge for up to a week.

To assemble the salad, place the mixed leaves, beans and almond slithers on a serving platter, along with the caramelised nuts. Pour over the dressing and toss well.

Fiona Rigg

Fiona is a highly sought-after food stylist, food economist and recipe developer working with leading photographers, chefs, food companies, electronic and print media. At her purpose-built studio kitchen in Red Hill on the Mornington Peninsula, Victoria, she continues her styling and recipe development as well as a new endeavor producing bespoke healthy and eco-friendly dog treats.

Soybeans and global warming

Soybeans are an annual summer legume grown in irrigated or heavy-rainfall areas of southern Australia. Climate change is likely to lead to unpredictable rainfall and a lack of water at times, which will affect soybean production. An extra 1°C increase in summer temperatures could decrease yields by 16 per cent. This might be partly offset by additional water resources, however the area used for soybean cropping in south-west NSW has already shrunk due to the high cost of water. Drought-tolerant varieties will help sustain production to meet domestic demand and tap the international market for non-genetically modified beans.

VEGETABLES

Kale and global warming

Kale, or a plant very similar to it, was one of the most commonly eaten vegetables throughout Medieval Europe until the development of the domesticated cabbage. In recent times this brassica has seen a resurgence in popularity due to its nutritional benefits. It grows best in temperate climates; cooler weather makes maturing leaves sweet whereas heat increases their bitterness. Higher temperatures associated with climate change are therefore likely to reduce the viability of currently suitable growing areas in Australia.

Kale chips

Kale is easy to grow and I often have a few varieties at once. Its yield supplies more than enough for me and the neighbourhood. Making kale chips is a really tasty, economical and healthy way to use the vegetable. Eat the chips as a snack, mix them through salads or use them to garnish steamed veggies.

Serves 2
Cooking time 20 minutes

Ingredients

- 1 bunch kale, any variety
- 1-2 tbsp olive oil
- unrefined salt

Method

Preheat your oven to 190°C. Wash and dry your kale well. You may need to wash it a couple of times as it is sometimes difficult to get all the dirt off first time. Strip the leaves from the stems. You need the kale to be very dry: if you have one, use a salad spinner to spin the leaves; if not, spread the kale on a tea towel, press out as much water as possible, then wait until completely dry.

Chop the kale into bite-sized pieces about 5 cm square and toss into a large salad bowl. Using your fingers, thoroughly rub the oil and salt all over the kale.

Place the kale pieces flat on baking trays. Be careful not to let any overlap or they won't crisp up. Bake for 10-12 minutes, keeping an eye on them as they tend to burn easily and will become bitter. Cool completely on the trays. You can store them in an airtight jar for about a week.

Variations

For a different flavour, add a ¼ teaspoon each of cayenne pepper and smoked paprika.

For salt and vinegar chips, add 1 teaspoon of apple cider vinegar and 2 teaspoons of unrefined salt with the oil. Sprinkle on 1 tablespoon of sesame seeds and some garlic or onion powder or sweet paprika.

Janella Purcell

Janella is passionate about living a healthy, balanced life easily, affordably and practically, nurturing the earth, ourselves and society. She lives and works in the world of organic wholefoods and natural health, with a focus on how to achieve sustainable and permanent wellness. Her cookbooks include *Janella's Super Natural Foods*, *Janella's Wholefood Kitchen* and *Eating for the Seasons*.

Cabbage and global warming

Cabbages are easily grown under a wide variety of conditions. Cool, moist weather results in the best-quality heads, though some varieties produce acceptable heads during warmer periods of the year. Climate change is likely to shorten the winter growing season of cabbage by up to a month by 2030 unless more adaptable varieties are developed. Higher temperatures will result in a longer period of pest activity, especially if production is extended into traditionally cooler periods.

Green cabbage, Vietnamese herb and peanut salad

I fear cabbage is somewhat underrated. Sure, it's a popular ingredient in coleslaw, but you would be hard pressed to find it in any other recipe. I love it for its flavour and texture, and this recipe lets its crisp sweetness shine.

Serves 4
Prep time 15 minutes

Ingredients

- 600 g green cabbage
- 80 g red onion, finely sliced
- 25 g Perilla or Shiso leaf, roughly sliced
- 18 g mint, roughly sliced
- 18 g Vietnamese mint, roughly sliced
- 1 tbsp garlic, chopped and fried
- 100 g peanuts, roasted and chopped
- 50 g shallots, fried

Dressing

- 1 tbsp caster sugar
- 3 tbsp Tamari sauce
- 1 tbsp rice wine vinegar
- 1 tbsp water
- 1 tbsp sesame oil

Method

Mix the dressing ingredients in a small bowl until the sugar dissolves and set aside.

Slice the cabbage as finely as you can, wash well then allow it to dry in a colander.

Place the cabbage in a mixing bowl with the sliced herbs, fried garlic, roasted peanuts and fried shallots.

Add the salad dressing, mix all the ingredients well and serve.

Mark Jensen

Mark is executive chef of the Red Lantern Food Group in Sydney and author of *The Urban Cook: Cooking and eating for a sustainable future*. He has appeared regularly as a guest chef on the television series *Ready Steady Cook*, and is a passionate supporter of ethical eating and sustainable food production.

> We're seeing abnormal temperatures and abnormal fluctuations in weather patterns. It seems to be consistently changing.

Leafy greens

John Said, Werribee, VIC

We grow what we call soft veg: lettuce, cauliflower, broccoli. Fresh Select is a family business. Founder Con Ballan started market gardening 60 years ago when he was a boy. Con has his son and son-in-law in the company. Then there's our family, the Saids.

Con and I met 30 years ago as a result of my past in retail: I was buying produce from the market where Con was selling. Through time we developed a relationship. We started buying small quantities of produce to sell retail, then larger quantities to sell to Asian neighbours like Singapore and Malaysia. From there we diversified and started to grow for the domestic market. Now we're one of the largest brassica and lettuce farmers in Australia.

We have three farming locations: Weribee in Victoria, Gatton in Queensland, and the Adelaide Hills in South Australia. In total, production is approximately 2000 hectares. We employ over 200 people.

The joy of farming is the fact we grow food. The health-conscious consumer is aware that most vegetables are super foods and should form part of your diet. We know our food fits that criteria consumers are looking for.

We always wanted to believe it was cyclic or blame something else, but there's no doubt climate change is a reality now. We're seeing abnormal temperatures and abnormal fluctuations in weather patterns. It seems to be consistently changing, it doesn't seem to be stabilised at all. It's becoming warmer. We're seeing summer temperatures during spring. We've seen summer drag out into April and just about into May at times. It's so varied.

It's one of our greatest challenges. Our yield's reduced, we have crop losses. We use a lot more water, and water's scarce enough as it. We grow varieties suited to the climate we think we'll be receiving and yet, we get such diverse conditions, they aren't capable of withstanding those changes. We have incursion issues with different pests and diseases because the heat attracts them. It really knocks us around.

We have what we call our nurture plan, which deals with sustainability and environment. We're very conscious of how we produce our food and we're doing everything possible from our end to help with climate change and the environment. What we can't change is what nature deals us. Once mother nature unleashes those forces, we can only do what we're working with.

As Australians we have an expectation that our food is readily available to us. As soon as we see a disruption in that, it'll cause great concern. Climate change will certainly disrupt food security, there's no doubt about that.

Greek salad

Greek country salad is the most beloved salad on every Greek table. These days you can enjoy it in almost every restaurant in and outside Greece. This dish is perfect for lunch, on its own with some crusty bread or as an accompaniment with just about every meal.

Serves 8
Prep time 10 minutes

Ingredients

- 8 tomatoes, cut into chunks
- 4 Lebanese cucumbers, peeled and cut into chunks
- 8 spring onions, chopped
- 2 green capsicums, seeded and diced
- extra-virgin olive oil
- red-wine vinegar
- 24 Kalamata olives
- freshly ground black pepper
- sea salt
- fetta cheese, cut into bite-size chunks (allow 3-4 chunks per person)

Method

Put the tomato into a wide salad bowl and add the cucumber, spring onion and capsicum. Pour over a good slurp of oil and allow to stand for 30 minutes. Add the vinegar and olives. Season, being careful with the salt as some fetta cheese varieties are more salty than others, and mix well. Scatter fetta over the salad and serve.

Janni Kyrtsis

Janni worked with Stephanie Alexander in Melbourne before becoming head chef at Berowra Waters Inn, winning the first Chef of the Year award from *The Sydney Morning Herald Good Food Guide*. He spent several years at Bennelong Restaurant, then opened his own restaurant, MG Garage. to date, he has been associated with 50 chef hats from *The Sydney Morning Herald* alone.

Cucumber and global warming

Cucumbers have been cultivated for more than 3,000 years. They grow on a creeping vine and are usually more than 90 per cent water, thus highly dependent on irrigation or reliable rainfall. Higher temperatures will accelerate cucumber emergence, flowering and fruit setting, and promote the plant producing more male flowers, considered less desirable than female ones. Risks to achieving good yields include a shorter fruiting period and deteriorating conditions for pollinating insects, on which the cucumber's separate male and female flowers depend for propagation and fruit set.

> Do nothing about climate change is not worth the risk. We've got to do as much as we can to reduce the impact we have on the earth and the climate.

Olives

Rob McGavin, Boundary Bend, VIC

I have a strong interest in what foods cause or prevent chronic disease. My mum died of breast cancer when she was 39 and my dad was diagnosed with cancer at 48 and has also since passed away. I firmly believe it all comes back to diet. The research shows how many good things are in extra-virgin olive oil that aren't available anywhere else.

I met my friend and co-founder Paul Riordan at agricultural college. We were both interested in health and emerging trends and opportunities. Doctors were saying you should consume olive oil but Australia wasn't really growing anything of significance. A huge amount of olive oil was being imported. There was no modern industry.

We planted the first trees in 1999 and have spent the time since really pioneering the industry. Our business now produces 60 per cent of Australia's total production. Cobram Estate is our flagship brand and we've had it since 2006. We have a huge focus on quality. High quality means it's better for your health and it tastes better.

Australia is the largest consumer of olive oil per capita outside of the Mediterranean. We see it as good crop for Australia as the trees are very hardy. They take a lot less water than most other crops, so if there's a drought where you don't water them, they'll still live.

We harvest once per year. It's one of the longest crops to grow – around nine or 10 months from when the tree starts budding up to the time you harvest. Olives are more susceptible to everything because of that. A five-minute hailstorm can wipe out everything; we had a $4 million insurance claim three years ago. I suppose it's not for the faint-hearted. It's challenging and it's unpredictable. The years where it's so hard make it even more rewarding when everything comes together.

In my lifetime there has been the lowest water allocation in the Murray-Darling basin that white man has seen. There was a very dry period in 2006-2008. Water was quite short. Then in 2010-2012 there was massive flooding. We had a lot of damage. One of our groves we could literally drive a boat through.

I don't know whether these things are just the way we are in Australia. It certainly doesn't seem to be getting any less variable, let's put it that way. Doing nothing about climate change is not worth the risk; we've just got to do as much as we can to reduce the impact we have on the earth and the climate. Cutting carbon pollution is a good idea regardless.

Quinoa, avocado, radish and pickled lemon salad

Quinoa is awesome to use in salads. It is simple to prepare, nutritious, cheap and tasty. This salad is really fresh and has nice textures and fragrance. Serve the salad on its own, as a light meal or with fish or chicken. There are great producers growing quinoa in Australia so please choose to buy local.

Serves 4
Prep time 25 minutes

Ingredients

- 60 g sugar
- 60 ml water
- 125 ml white vinegar
- 2 bay leaves
- 2 lemons
- 185 g quinoa
- 10 radishes
- 4 avocados
- 20 g flat leaf parsley leaves
- 20 g mint leaves

Method

In a small pan place the sugar, water, vinegar and bay leaves. Bring to the boil and reduce slightly.

Peel the lemons with a vegetable peeler then finely slice, add to the warm pickle mix and leave to cool.

Sprinkle quinoa into a medium-sized pot of boiling water. Cook for 7-10 minutes, until it is just tender. Drain well.

Wash and randomly chop the radishes, then peel and dice the avocados. Mix all ingredients, baring the herbs well while mixing.

Strain the pickled lemons and add to the mix.

Season and dress with a good olive oil.

Matt Stone

Matt Stone established a reputation as an innovator and award-winning sustainable cook, After starting an apprenticeship at Leeuwin Estate in 2003, he was appointed sous chef of the famed Perth restaurant Star Anise at age 20. He then joined Greenhouse Perth as executive chef, where he embraced the Greenhouse by Joost ethic of preparing fresh, sustainable, locally sourced wholefoods.

Avocado and global warming

Avocados grow on subtropical fruit trees that need a frost-free climate with little wind, as high winds can increase moisture stress, dehydrate the flowers and reduce pollination. Temperature is the main climate factor affecting viable production. Hot weather can cause sunburn damage and yield smaller fruit. Temperatures above 35°C can reduce flowering, because some types of avocado trees only produce flower buds under cool temperatures, and affect fruit development. As the climate warms, daily temperature ranges will narrow in the tropics and sub-tropics, reducing the overlap between the open stages of male and female plant parts and thus pollination chances.

Potatoes and global warming

Potatoes are susceptible to a disease known as "late blight", which rots the tubers and makes them inedible. Late blight can devastate crops as shown by its major role in the Irish potato famine in the 1840s. High temperature and humidity are its main causes. Climate change predictions indicate the risk of late blight is likely to rise by 2050 then decrease towards the end of the century in line with earlier planting times. For Australia's potato-growing regions in the south-west and along the eastern seaboard, however, the increase in risk predicted by 2050 is considered modest.

Macadamia nut potato salad with capers

I became interested in cooking as a child, watching my mother and aunts prepare meals. I was born in Wollongong but, as a Bundjalung man, my family originates from the Northern Rivers region in NSW. This recipe showcases the fusion of using native bush herbs such as the river mint and native basil together with the Macadamia nut native to Australia in a contemporary fashion.

Serves 4
Prep time 40 minutes

Ingredients

- 1 kg chat potatoes
- 32 g macadamia nuts, roasted and chopped
- 4 tsp small capers, drained
- ½ tsp river mint
- ½ tsp native basil
- 4 tbsp olive oil
- 2 tbsp red wine vinegar
- 1 tbsp lemon juice
- 4 shallots, finely sliced
- ½ red capsicum, diced
- ¼ tsp ground pepperberry
- salt to taste

Method

Boil the potatoes in a large saucepan until tender but still firm; do not overcook. Quarter them while they are warm and set aside in the refrigerator to cool. When the potatoes are chilled, add macadamia nuts, capers, river mint and native basil.

In a small bowl, mix the oil, vinegar and lemon juice. Add shallots and capsicum, season with ground pepperberry and salt. Pour over potatoes and toss gently to combine.

Mark Olive

A chef for more than 25 years, Mark Olive – aka "The Black Olive" – has become well-known for his charismatic style and creative approach to food, with a passion for fusing native cuisine and culture with contemporary lifestyle cooking. He has presented his own television series, *The Outback Café*, and appeared on a host of cooking, lifestyle and travel shows.

> The thing that concerns us most is the increased frequency of heavy rain events, because a warmer atmosphere holds more moisture.

Potatoes

Nathanael Harris, Berrigan, NSW

I'm a fifth-generation farmer. Before I could walk I was out on the farm, on the tractor with my old man. Dad grew up on the farm; he left school when he was 12. His dad was the same. It was my grandpa who changed to spuds; my great-grandfather was a fruit farmer.

We're a family-run business. Four of us run the day-to-day: me, Dad, my cousin and his old man. Nan, up until recently, used to do all the bookwork. If it's a busy harvest, my sisters might help grade.

Working for the old man is really flexible. We occasionally clash a bit, but I suppose that's going to happen when you work with family. I really enjoy it. I'm qualified in IT, so I combine that with electronics for our machinery. It allows me to be creative. I love making and fixing stuff, so it's right up my alley.

We probably do between 1,000 and 2,000 tonnes of spuds a year. We mainly grow two varieties, Sebago and Wilja, which are the two most common varieties you'd get in the supermarket. We bag and sell locally and to a few factories in Sydney and Melbourne. My cousin also does the farmers' markets.

Of all vegetables, spuds require the least amount of water per kilo to grow, so the drought over the past 10 years hasn't knocked us around too much. The thing that concerns us the most is the increased frequency of heavy rain events, because a warmer atmosphere holds more moisture. In the big downpours we've been getting seven inches at a time. Our spuds are getting drowned. When they sit in water, they just start rotting. Once that happens it's all over.

At the start of the year we got massive rains. The spuds were under at least a foot of water. In my lifetime I've never seen it that bad. We had to dig channels around the crop and pump the water out. We still lost about 50 per cent.

The rain also uncovered a lot of soil; when spuds are exposed to the sun for too long they go green and then they're no good. For the first time ever we had to hire outside workers because of all the rubbish. We grade all the spuds out in the paddock by hand so it was a lot more work for us. I can usually grade them just by myself, but I had to have another three blokes help me.

Thirty years ago in our area there were 40-odd spud growers. Now there's only two of us left in the whole Southern Riverina. There's obviously been a big impact there somewhere.

Salt baked sweet potato with smoked potato mayonnaise

At The Four in Hand we loved potato. Desiree, Pontiac, Kipfler, Dutch Cream – you name it, we mashed them, baked them and roasted them in duck fat. When I opened 4Fourteen I wanted to put sweet potato on the menu, as I have always liked to cook it at home. Sweet potatoes are just so good for you. Full of vitamins A, C and E, they are great for the immune system and can help prevent heart disease and cancer. Being so delicious it's hard to believe they are fat-free and cholesterol free. Happy cooking!

Serves 4
Prep time 90 minutes

Ingredients

- 3 kg rock salt
- 50 g smoked paprika
- 1 bunch thyme, roughly chopped
- 1 bunch rosemary, roughly chopped
- 10 g coriander seeds
- 2 large sweet potatoes, 700-800 g each
- 2 royal blue potatoes
- smoking chips
- 200 g plain mayonnaise
- 1 lemon, juiced
- 100 ml evaporated milk
- salt to taste

Method

For the sweet potato, mix the rock salt, smoked paprika, thyme, rosemary and crushed coriander seeds in a bowl and combine. Place one-third of the mix on the bottom of a roasting pan, place the sweet potatoes on top of the salt and then cover them with rest of the salt mix. Roast at 180°C for 60-90 minutes or until potatoes are soft enough to pierce with a knife.

For the smoked mayonnaise, peel and boil the royal blue potatoes until soft and easily mashed. Pass mash through a drum sieve or ricer. Put smoking chips in the base of a steamer pot and place on a high heat until they start to smoke heavily. Use a blowtorch, if you have one, to speed up the process. Put the mash in the steam pot above the chips, cover with a lid and smoke for 6 minutes. Allow to cool.

Place smoked potatoes and evaporated milk in a kitchen aid and whisk until combined, add plain mayonnaise, smoked paprika, lemon and season to taste with salt.

To serve, char-grill roasted sweet potato and top with mayonnaise.

Carla Jones

Growing up in a family that always cooked and shared an abundance of fresh local produce, Carla Jones had a passion for cooking from a young age. After working under Colin Fassnidge at The Four in Hand, they opened restaurant 4Fourteen together, which *The Sydney Morning Herald* awarded a chef's hat just weeks after its doors opened.

Sweet potato and global warming

The vitamin-rich sweet potato – which despite its name is only distantly related to the potato – is a significant food crop in the developing world, and may become even more important to global diets as the world warms. It can be grown in hot conditions, is relatively drought-tolerant, prospers from higher levels of atmospheric carbon-dioxide and has many varieties with adaptive potential. There may, however, be some risk to current areas of commercial cultivation in Australia, predominantly in Queensland, from higher rainfall events, since water-logging can cause tubers to rot.

Carrots, tops, honey and black garlic

This dish came about because we had a few carrots in our kitchen garden – though we actually get most of our carrots from Martin Boetz at the Cooks Co-op near the Hawkesbury River. We wanted to use the whole carrot, so we made a pesto from the tops. The black garlic has an amazing caramel, balsamic quality and is great to fold through some yoghurt and serve with the sweet carrots. Even without the yoghurt it is still a tasty little dish.

Serves 4
Prep time 20 minutes

Ingredients

- 3 good-sized bunches of baby carrots, with washed tops on
- 50 g toasted flaked almonds
- 30 g honey
- 1 handful basil leaves
- 1 tsp roasted coriander seeds
- 50 ml light olive oil
- 1 lemon
- salt and pepper
- 1 garlic clove
- 1 black garlic clove
- 100 g grated parmesan
- 80 g sheep's yoghurt

Method

Cut the tops from the carrots, season with oil, salt and pepper, then char over the coals or on a char grill. Char the carrot tops a little and set aside. If you don't wish to char the carrots at home, cook in a 190°C oven for about 10 minutes.

With a pestle and mortar, smash some of the tops along with coriander seeds, almonds, honey, oil and cheese to make a pesto. Mix the pesto in a bowl with carrots and add more salt and lemon juice.

Peel and crush the black garlic, then mix into the yoghurt and finish by spooning the yoghurt into a large bowl with the carrots on top.

Darren Robertson and Mark LaBrooy

Mark and Darren are chefs/owners of the Three Blue Ducks café/restaurant in Bronte, Sydney, and a new venture on The Farm at Byron Bay. With fellow ducks Sam Reid, Jeff Bennett and Chris Sorrell, they aim to create places to relax and enjoy casual, nourishing, delicious food. Their cookbook, *The Blue Ducks*, was published in 2013.

Carrots and global warming

More Australian households – 95 per cent – buy carrots than any other vegetable. They are also the nation's most valuable vegetable export. Carrots can grow in temperatures between 10-25°C but the best conditions are 15-18°C. Warmer temperatures will adversely affect the carrot's flavour, texture and physical structure. Higher temperatures associated with climate change are therefore likely to make carrot production less viable in warmer areas, with possible shifts to cooler regions such as Tasmania.

> We don't have the defined seasons we had 20 to 30 years ago. It's wet and dry at unusual times. That certainly presents challenges.

Brussels sprouts

Scott Samwell, Mount Barker, SA

We're Brussels sprout growers. We also grow cabbage for processing – making coleslaws, that sort of thing. Our new product is kale sprouts, which are a cross between red kale and green Brussels sprouts.

I'm a third-generation grower. My grandfather started the farm back in the 1950s and my uncle and my father continued it. Nowadays my brother, my cousin and I run operations along with them. The business has gradually grown over the past 30 years to cover about 1,500 acres across four properties.

What I like about farming is the lifestyle; living on the land, working the land, your family all out with you. Everyone's doing their bit and it's good synergy. I get great satisfaction in growing a nutritious product. I'm pretty focused on trying to maintain healthy soils to give me a healthy plant.

Once the harvest season gets going, we do about 50 to 60 tonnes a week of sprouts, which get packed and sent all over Australia. Through summer we do about 15 to 20 tonnes a week of cabbage; through winter it might be down to around 5 to 10 tonnes.

For the past 15 years I could never say what kind of year we were going to have. The weather's all over the place. Nothing's the same anymore. There's a blurring of the seasons. We don't have the defined seasons we had 20 to 30 years ago. It's wet and dry at unusual times. That certainly presents challenges for us as we try to grow all year round.

We're having to use a lot more water than we used to. Previously we could rely on good winter rains to carry us through quite nicely to the summer. Now we're having to irrigate all our ground down before we can start working. We can irrigate, but it's not as good as rain.

We've split our property so we can mitigate risk with the climate. We've got land where it's drier and sandier and we've got land which is wetter with heavier soils. If I'd planted last year in the wetter soil, instead of the sandy soil, I probably would have had some crop loss.

Farmers in general need to adapt or we won't be able to continue what we're doing. If I don't adapt, if I just want to stay with the old school of thought, I can't imagine I'll be very successful in the coming years. I need to monitor how I do my plantings, how I protect the soil, my irrigation schedules and my nutrient management. Being able to react quickly and be proactive about any changes in the weather system is what will be most beneficial for me as a grower.

Ten vegetable minestrone with ricotta pesto

This dish is inspired by everything spring and summer. Full of beautiful, seasonal, fresh vegetables, cooked in such a way that complement each other perfectly, this is a honest and hearty soup suitable for any occasion. You must first create a vegetable stock that enables the soup to have a great depth and body of flavour. The vegetables must be cut the same size, small enough so when you eat the dish you get a good selection of vegetables with every mouthful. The pesto is a great way to give the soup extra punch and freshness.

Serves 10
Prep time 1 hour 15 minutes

Ingredients

- 1 onion, medium, finely diced
- 2 celery sticks, finely diced
- 3 flat leaf parsley stalks, leaves only
- 1-2 tbsp olive oil
- 1 potato, medium, peeled, 1 cm cubes
- 2 tomatoes, peeled, seeded and diced
- 1 zucchini, small, cubed
- 50 g peas, fresh
- 50 g green beans, fresh, cut into 2 cm lengths
- 1.5 litres vegetable stock
- 50 g borlotti beans, canned
- 4 stalks silverbeet, chopped, leaves only
- 140 g cooked rigatoni
- salt and freshly ground pepper to taste
- 4 tbsp ricotta pesto (see recipe below)
- extra ricotta for crumbling over soup

Pesto

- 1 bunch basil
- 1 garlic clove
- ½ tbsp pine nuts
- 1 tbsp parmesan
- 50 g ricotta
- 50 ml olive oil

Method

Heat a saucepot with olive oil. Add onion, celery and parsley and cook over medium heat until soft but without colour. Add the potatoes and tomatoes.

Add zucchini, peas and green beans and cover with vegetable stock. Cook the soup until the vegetables are soft but still retain their shape. Remove from heat and strain. Add half the cooked vegetables back to the soup and blend with a stick blender until puréed. Put the remaining vegetables back with the soup purée. Return the pot to the heat and add the borlotti beans, silverbeet and rigatoni. Simmer for 5 minutes.

For the pesto, blend all ingredients except basil in a food processor until smooth. Add basil and blend until smooth.

To serve, add pesto and salt and pepper to taste and ladle into warm bowls. Garnish with crumbled ricotta.

Emma D'Alessandro and Adam Draper

As head chefs at Melbourne's renowned Donovans restaurant, Emma D'Alessandro and Adam Draper have delighted diners with distinctive culinary offerings. The two award-winning cooks, from very different backgrounds, make a rare team working in the same kitchen. Emma has a traditional Italian heritage, while Adam was born and raised in rural Victoria. Both are great believers in fresh home-grown produce.

Zucchini and global warming

Zucchini is a member of the gourd family, which includes pumpkins, cucumbers, squash and melons. It is considered to be one of the easiest vegetables to grow in temperate climates, so long as it gets sufficient moisture (being 96 per cent water). Rapid germination and vigorous growth occur at soil temperatures between 18-32˚C. Zucchini responds very well to elevated levels of carbon dioxide but is susceptible to extreme temperature events and has little drought tolerance. Higher temperatures and higher atmospheric carbon-dioxide levels may also increase the risk of diseases like powdery mildew.

MEAT AND DAIRY

Beef and global warming

Beef production in southern Australia typically relies on cattle breeds of temperate origin, such as Angus and Hereford, grazing intensively managed pastures. Warmer and drier climates in the future will pose significant challenges to these beef-production systems. Pasture-growing seasons are expected to contract, leading to lower and more variable animal stocking rates and increased reliance on supplementary grain feeding. Reduced rainfall will limit capture of runoff to supply drinking water, an issue highlighted during the Millennium Drought. Increased heat stress may lead to farmers choosing more heat-tolerant cattle breeds possibly of lower meat-eating quality.

Bo la lot

This typical Vietnamese dish is found everywhere on the streets of Hanoi and beyond. Our Blackmore Wagyu mince is infused with lemongrass, garlic, chilli and a Vietnamese staple, fish sauce. We roll them into little cigars and then wrap them in fresh betel leaves. They are lightly steamed and finished over charcoal to give a extra layer of flavour with a rich smoky undertone. Accompanied by a light peanut sauce, these are a great snack, canapé or light meal.

Serves 9
Prep time 45 minutes

Ingredients

- 1 kg beef mince
- 3 lemongrass stems, white part only
- 8 spring onions
- 1 bunch coriander roots
- 1 clove garlic
- 3 tsp salt
- 3 tsp white pepper, ground
- 2 tbsp fish sauce
- 2 tbsp chilli paste
- 40 betel leaves, picked, washed and dried
- 10 g peanuts
- 5 g crispy onion
- 200 ml peanut sauce

Method

Finely chop the lemongrass, spring onions, coriander and garlic. Combine all the ingredients except betel leaves. Allow to infuse for 30 minutes.

To form a roll, lay 1 betel leaf shiny side down. Spoon 30 g of mix on top, then roll like a cigar. Make 4 pieces per portion.

Cook by steaming the leaves for 4 minutes, then grill to gain colour.

Serve with peanuts and crispy onion along with 50 ml of peanut sauce.

Shannon Bennett

Shannon opened his first restaurant Vue de monde at age 24 and was quickly noticed for his edgy approach and obsession with classical cuisine. *Australian Gourmet Traveller* judged him best new talent in 2003. Vue de monde and other ventures like Jardin Tan, where this recipe emanates from, exemplify his belief that restaurant food can be a wondrous experience. His flair and commitment to sustainability is evident throughout.

Lotus burger

This recipe is for my ultimate burger. It's really important you use really good-quality beef because the burger is best served medium to medium-rare. The caramelised onions can be prepared a few days beforehand and are great condiments for other sandwiches and charcuterie as well.

Serves 5
Prep time 2 hours

Ingredients

- 400 g grain-fed beef brisket, top layer of fat removed
- 400 g grain-fed beef chuck, excess fat removed
- 200 g dry aged beef fat
- 3 large white onions
- 1 tbsp brown miso
- 50 g unsalted butter
- 10 slices of smoked speck, about 10 cm long
- 5 soft sesame-seed buns, about 13 cm wide
- 3 large pickled dill, sliced on a mandolin about 2 mm thick
- Japanese mayonnaise, Kenko brand
- 5 slices of American-style cheddar cheese
- tomato sauce

Method

Chop the chuck and brisket into long pieces to fit inside a mincer. Place sliced meat in a bowl in freezer for 1 hour or until beginning to harden; this prevents the meat overheating and melting in the mincer. Carefully mince meat, alternating pieces of brisket, chuck and fat.

Place mince in fridge to firm for 1 hour. Portion mince into 200 g patties and flatten evenly between your hands, making each patty about 5 mm wider than the bun. They will shrink when cooked.

Peel onions and slice as thin as possible. In a shallow saucepan, melt butter and add onions with a pinch of salt. Cook over a medium heat, stirring continuously until onions are dark brown with a soft texture. Once onions are completely cooked down, add miso paste and gently stir until well combined. Remove onions and put in a container to keep warm.

For the hamburger buns, prepare a bamboo steamer on top of a pan of simmering water. Prepare a char-grill/grill plate for the bacon. Preheat oven to 180˚C.

For the patties, bring a large oven-proof frying pan to high heat. Add 1 tablespoon of vegetable oil. When oil starts to smoke, season patties on both sides with a little salt and place gently in pan. Fry for about 2 minutes on one side then flip. The patty should have a nice brown crust.

After flipping, cook for a further 30 seconds then add two slices of cheese. To melt the cheese, cover the pan with a lid or bowl to steam for about 1 minute.

While patties are steaming, grill bacon on a high heat until nicely charred, but not crispy. Steam buns for 30 seconds or until soft.

To assemble, place half a tablespoon of mayonnaise on the bottom bun. Smooth out with back of a spoon. Add a tablespoon of onions, again evenly spread. Add the patty, cheese side up. Place 2 slices of bacon side by side on top of cheese, then pickles in a single layer covering the whole patty. Top with tomato sauce, moving outwards in a spiral. Add top bun.

Dan Hong

Starting his career in the kitchen of his family's Vietnamese restaurant chain, Thanh Binh, Dan Hong has captured the attention of Sydney's foodies and cemented his reputation as one of the city's fastest rising culinary talents as executive chef of four restaurants – Mr Wong, Ms G's, Papi Chulo and El Loco – run by the Merivale group.

Onions and global warming

Onions are Australia's fourth-largest vegetable crop, making up about 9 per cent of total vegetable production, with South Australia and Tasmania being the dominant growing areas. Though a reasonably hardy crop, it grows best with cooler temperatures during early development; higher temperatures cause "bolting", meaning flowering stems begin to grow early, with the result being smaller bulbs and reduced quality. The crop is prone to attack by a number of pests and diseases predicted to increase with climate change. Warmer temperatures will also tend to reduce time to harvest onions.

> We're borrowing the land from the next generation, and with every borrowing there's interest to pay.

Beef

Derek and Kirrily Blomfield, Liverpool Plains, NSW

We produce grass-fed beef in a regenerative grazing system. We supply direct to consumers, straight from the farm to the plate. We've always been proud of the way we produce our beef but in the past, as soon as the cows left on a truck, everything we'd done could be undone. Selling direct raises the accountability stakes. We're directly responsible for the quality of people's meals.

My grandparents bought the farm in 1946. My father, Sandy, is still involved in the day-to-day activities. Our two boys, Patrick and Reilly, are too young to be in the business but I take them out with me and they help move animals and portable troughs around.

We have a vision to produce healthy and nourishing food from thriving, living, profitable farms. It's great that we are able to correct former mistakes made with the land. Even though we own this property, we don't *really* own it; we're borrowing the land from the next generation, and with every borrowing there's interest to pay. That interest payment for us is making sure we hand it on in better condition than when we started.

Our focus is regenerative farming, using cattle to manage the landscape. Careful grazing means we are able to improve pastures and regenerate soils, and we have been able to move away from chemicals and artificial fertilisers. Our approach is to work with nature, using the systems already there; they're the ones that are going to work best.

Our farm is in a coal exploration lease. We see a bit of irony in that. We're all about producing healthy food sustainably and trying to regenerate the farming landscape, yet we're under a cloud of having a coal mine built directly beneath us.

As farmers, of course we're worried about climate change. In the time my family's been here we've always had a cycle of horrendous droughts. However, they occurred on a longer cycle; since 2002 there have been lots of mini-droughts and mini-floods. The consistency of the weather has disappeared. When it does rain, you think: "I've got to use what growth I get from this the best way I can, because I don't know when the next rain's coming."

Planning our grazing has really helped. We can ration out the grass we have and know where we stand. We need to be planning, because there's no future in just hoping.

Smart agriculture is a way we can help tackle climate change. We have the obligation to do things the best we can and manage our landscape to minimise the impact. As farmers, if we start changing a few paradigms around the way we produce food, we can contribute to the correction.

Chickens and global warming

Chickens are susceptible to heat stress, with the best temperature range for them to thrive being 18-22˚C for broilers (birds destined to be eaten), and 19-22˚C for laying hens. Heat stress on broiler chickens causes reduced feed intake, poor weight gain and poor meat quality. For laying hens, effects include poor laying rate, reduced egg weight and shell quality, reduced fertility and increased mortality. Intensive poultry industries rely heavily on feed such as wheat and barley, thus any negative impact of climate change on the grain industry will have flow-on costs to poultry production.

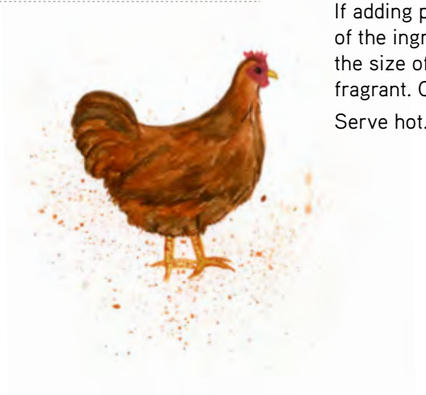
Chicken with saffron and capers

In this Italian recipe the chicken is cooked al guazzetto, meaning liquid is added during cooking to add moisture – in this case vinegar and wine. The acids will soften the meat. Tenderising the chicken will help it absorb flavours imparted by the spices or vegetables – in this dish saffron and capers, which are used in Sicilian and Sardinian cooking. Serve with Sardinian fregola or couscous, or use different grains – rice, quinoa or bulgur wheat. You can also cook potatoes with the braise or serve them separately.

Serves 6
Prep time 40 minutes

Ingredients

- 1 whole chicken, cut into 4-6 chicken pieces
- 1 onion, sliced finely
- 80 ml extra virgin olive oil
- 2 cloves of garlic
- 25 g of parsley, chopped finely
- 1 tbsp vinegar,
- 2 tbsp wine
- 2 tbsp capers
- 2 large pinches of saffron
- salt and pepper to taste



Method

A heavy saucepan with a good lid is ideal for braising.

Pat the chicken dry with paper towels. Heat oil in pan over medium heat. Add chicken pieces to hot oil in a single layer without crowding. Cook 6-8 minutes per side or until chicken is browned. Repeat with remaining chicken pieces if necessary. Remove chicken pieces and set aside.

Sauté the onion and garlic in the same pan and in the same oil; add sliced onions and cook for about 5 minutes or until softened, stirring frequently.

Return the chicken to the pan, add parsley, vinegar, saffron, wine, capers and seasoning. Add 4 tablespoons of boiling water (or white wine or stock). Seal with a lid and let it cook undisturbed on low heat.

If adding potatoes, add them at the same time as the chicken but cover all of the ingredients with liquid – approximately 200-250 ml depending on the size of your pan. The potatoes will absorb the water and be soft and fragrant. Check as it cooks and add more water if necessary.

Serve hot.

Marisa Raniolo Wilkins

Marisa was born in Sicily and spent her childhood in the northern Italian city of Trieste before moving to Adelaide. She now lives Melbourne. Her interest in food is driven by her desire to explore her origins and fuses cultures and experience. She has authored two cookbooks, *Sicilian Seafood Cooking* and *Small Fishy Bites*.

Olives and global warming

Olives are mainly produced in lower-rainfall Mediterranean climates, meaning wet winters but hot, dry summers. Climate change could have a positive impact on the olive industry by extending the range in which the trees can viably grow, as they tolerate hot climates and drought conditions. In Australia, bush fires have destroyed large olive plantations, with younger trees more susceptible to death from fire. However, older olive trees can recover from fire with careful pruning.

Barossa chicken with green olives

I love this recipe made with our Barossa Chicken Marylands (thigh with drumstick attached) and a simple tomato and olive sauce. It is full of flavour, easy and so vibrant on the plate. In my family the food philosophy is keep it simple. We raise our birds the old-fashioned way, letting them grow on a vegetarian diet with no additives until they are proper chooks. This gives them a flavour different to other chickens. A meal full of comfort and warmth.

Serves 2
Prep time 90 minutes

Ingredients

- 2 Barossa Chicken Marylands or 4 thigh chops (600 g in total)
- 8 tsp extra-virgin olive oil
- 2 cloves garlic, diced
- 10 g Murray River salt
- 2.5 g Australian pepper
- 1 pinch of sugar
- ¼ preserved lemon, finely diced
- 1 onion, chopped
- 400 g ripe tomatoes, chopped
- 80 g green olives (or Kalamata), pitted and halved
- 250 ml chicken stock
- 235 ml water
- basil to garnish

Method

Mix 4 teaspoons of olive oil, garlic, salt, spices and diced preserved lemon together.

Rub the spice mix over chicken. Let the chicken marinate for 30 minutes.

Heat a similar amount of olive oil in a heavy-based oven-proof pan and gently brown the chicken over moderate heat.

Remove the chicken from the pan and add onion, cooking gently until tender.

Add the tomato and cook for 2 minutes. Add the olives, then place the chicken back in the pan with onion, tomato and olives, and add the chicken stock.

Place in a preheated 180°C oven and cook for 40 minutes.

Serve with couscous, rice or crusty bread and salad. Garnish with basil.

Saskia Beer

Saskia grew up in the Barossa Valley surrounded by the principles of good farming and honest cooking through mother Maggie's restaurant, The Pheasant Farm, and father Colin's game-bird farming. Her family's beliefs and the Barossa lifestyle, where fresh food flavours are cherished, underpin Saskia's work as a free-range producer, chef and food educator.

Capsicums and global warming

Capsicums are grown commercially in frost-free, tropical and subtropical areas throughout Australia. Most production occurs in Queensland, South Australia and Victoria. Warm conditions over a five-month growing period are necessary for high yield and quality, with temperatures of 20-25˚C being ideal for growth. Temperatures above 27˚C during the ripening phase result in the fruit developing a yellowish colour, while temperatures above 30˚C can cause flower buds to fall, fruit scorching and reduced pollination, all leading to lower yields. In some regions there may be increased risk of damage from frosts due to reduced cloud cover.

Spanish-style chicken casserole

This dish is incredibly simple, and lots of garlic and paprika give it a real Spanish feel. You can also use chicken breast if you like, and cut the cooking time down to about half an hour. Remember the breast is leaner, so it won't be as moist.

Serves 4
Prep time 90 minutes

Ingredients

- 6 free-range chicken legs
- 80 ml extra virgin olive oil
- 1 brown onion, chopped
- 2 garlic cloves, crushed
- 2 tsp sweet paprika
- 1 red capsicum, sliced
- 250 ml dry sherry
- 400 g can peeled tomatoes, roughly chopped
- 2 tbsp tomato paste
- 125 g green olives, pitted and halved
- 1 large handful flat-leaf parsley
- 1 lemon
- sea salt
- freshly ground pepper

Method

Put the chicken legs on a chopping board and separate the thighs from the drumsticks.

Heat the extra virgin olive oil in a large, deep saucepan with a tightly fitting lid and add the chicken in batches. Cook over a medium heat for 4 minutes, or until browned, then remove.

Add the onion, garlic and 2 teaspoons of the paprika, some sea salt and the capsicum. Cook for 5-8 minutes, or until soft.

Add the sherry and cook for 2 minutes, or until slightly reduced and the alcohol burns off.

Add the tomatoes and tomato paste, stir well and cook for 2 minutes.

Return the chicken to the pan and add 250 ml water. Gently simmer, covered, for 1 hour, then uncover and cook for 15 minutes.

Add the olives and parsley, cook for a further 1 minute, then remove from the heat.

Sprinkle the chicken with the remaining paprika, squeeze lemon juice over and give a good grind of pepper. Divide among four bowls and serve.

Neil Perry

Neil is one of Australia's leading and most influential chefs. After managing several quality restaurants in Sydney, he opened the flagship Rockpool in 1989. The Rockpool Group now includes eight restaurants in Sydney, Melbourne and Perth. Perry was awarded the Order of Australia in 2013 for his work supporting charities and his achievements as a restaurateur.

> The climate change issue that affects our business most is the knock-on effect of escalating feed prices linked to increased extreme weather events around the world.

Chicken

Rob Nichols, Sassafras, TAS

I emigrated in 1982 with my parents from Britain, where we were poultry farmers. We moved here with the intention of never seeing chickens again. That didn't last for too long. We eventually got back into egg production and ultimately into meat processing. I suppose old habits die hard. Within our family, it goes back four or five generations – more than 100 years of continuous involvement in chicken production. I don't think too many people can claim that.

Our chicken production has grown to the point where we now meet 40 per cent of Tasmania's chicken demand. We have a processing plant on site where we value-add and further process chicken to dispatch throughout the state.

Tasmania hasn't been knocked around too much by global warming. The climate change issue that affects our business most is the knock-on effect of escalating feed prices linked to increased extreme weather events around the world. Over the past few years grain prices have been highly volatile, spiking quite dramatically on occasion. Availability of product can be very unpredictable too. In the past it was a given that we could buy grain on the day we needed it at a price that was affordable. Now we're having to start forward contracting to make sure we can cover that risk.

Back in 2008 we built a wind turbine to produce in excess of half the energy requirements of Nichols Poultry. It's been chopping away merrily and has been a very successful way for us to mitigate energy costs.

I've become a bit of a spokesperson for the wind industry in Tassie, or for the concept of embedded generation, where single turbines are placed on individual farms. There's a lot of benefits they can bring to rural economies. Most power-generation facilities are located near major metropolitan areas. With renewable energy, especially if it's done on a farm, the power generation and all the construction and maintenance work is kept in the region.

It's very difficult to make farming seem sexy to the next generation. That's one of the reasons I'm frustrated that renewable energy hasn't taken off to the extent I think it should. We need to allow more developments like this to sustain rural districts.

Some people might not accept the science of climate change, but the risk is that you don't get second chances. If we're wrong, so what? All we will have done is made businesses more viable and efficient, preserved vast areas of the environment and migrated to renewable energy systems. What's wrong with that?

If the climate science is correct, we're going to have to do it anyway, so why wouldn't we embrace it? The worst we can do is to make the world a better place.

Lamb and global warming

"Spring lamb" refers to the seasonal peak of lamb produced during spring. This production system relies on sheep grazing on highly nutritious pastures during winter and spring. Climate projections for reduced spring rainfall, and greater variability in rainfall patterns in southern Australia, will challenge this traditional production system. Alternative systems will be needed to adapt. In some regions this could include greater use of drought-tolerant native shrubs such as saltbush, and perhaps also increased feedlot-finishing of lambs to manage the uncertainty of seasons.

Lamb belly sliders and curds on a brioche bun

This dish uses ingredients sourced from producers local to Bowral, NSW. Food at its best tells stories of our land, its seasons and the ingredients it provides. At Biota Dining, we see our role as telling these stories with integrity and respect. We are the connection between mother nature and the diner.

Serves 6
Prep time 2.5 hours and 8 hours cooking time

Ingredients

- 2 lamb breasts/bellies
- 1 bunch saltbush
- 1140 g bakers flour
- 8 tsp salt
- 9 tsp dry yeast
- 175 g sugar
- 450 g milk
- 120 g water
- 3 eggs
- 300 g butter
- 400 g pecora curds, or similar
- 1 Cos lettuce heart
- 50 g aioli

Method

Trim lamb belly and salt it for about 2 hours, then gently rinse the salt off and put lamb belly in water. Cover and place in oven heated to 95˚C. Slow cook for 8 hours.

Once cooked, place in the fridge to cool. Sear in a hot pan to render the fat when needed.

For the brioche buns, mix the flour, salt, milk, yeast and sugar. Bring dough together slowly with the eggs and soft butter. Once combined, allow to rest for about 2 hours.

Once rested, roll into 50 g rolls and bake at 160˚C for 11 minutes.

To serve, leave curds out at room temperature until needed. Remove outside leaves of lettuce and cut the heart in half. Assemble curd, lettuce, aioli and lamb belly onto bun and enjoy.

James Viles

James Viles opened Biota Dining, in Bowral, NSW, with a vision of creating a dining destination using artisan produce from local farmers and growers. Most recently Biota retained its two chef hats in the 2015 Sydney Morning Herald Good Food Guide Awards and was named best regional restaurant in the 2014 Australian Traveller People's Choice Awards.

Saltbush lamb shanks with wattleseed, grains and bitter leaves

This recipe shows how we can substitute ingredients to promote sustainable produce. Saltbush-grazed lamb and wattleseed from NSW's sheep and wheat belt represent initiatives by farmers to adapt to changing environmental conditions. Planting saltbush and wattle helps to combat dryland salinity and top-soil erosion. These ingredients are uniquely Australian and their flavours work exceptionally well together.

Serves 5
Prep time 2 hours and 5 hours cooking time

Ingredients

- 4 saltbush lamb shanks
- 1 bottle of red wine
- 2 cloves garlic
- 3 eschalots
- 2 stalks of thyme
- 2 fresh bay leaves
- 1 lemon peel
- 250 g butter
- 250 ml chicken stock

Sauce

- 2 tbsp fat, reserved from shanks
- 2 tbsp flour

Spice mix

- 2 tbsp wattle seeds
- 1 tbsp fennel seeds
- ½ bunch mint leaves
- ¼ tsp peppercorns
- ½ tsp salt flakes

Grains

- 100 g dried spelt
- 100 g pearl barley
- 100 g rye grains
- 1 clove garlic, crushed
- 1 brown onion, finely diced
- 100 g speck, diced
- 100 ml chicken stock
- 1 small red radicchio

Method

To braise the shanks, add all braising ingredients to a crock pot or deep casserole dish with a lid. Make a strong seal by covering first with a sheet of baking paper then tin foil and the lid on top; this will stop any heat escaping, helping the meat cook at an even temperature.

Bake in oven pre-heated to 140°C for 4-5 hours on a low temperature until the meat is very tender and falling off the bone. Be careful when opening the seal of the foil as the steam will be very hot and can cause nasty burns. Let the shanks sit overnight under the liquid

After the shanks have sat in the fridge overnight, skim off all the fat from the top and reserve 2 tablespoons to make the sauce. Remove the shanks from the pot and reduce the stock by half.

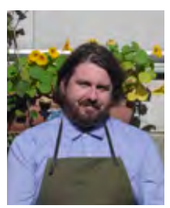
While the stock is reducing, make the sauce by cooking the fat and flour together for 3-5 minutes until lightly toasted, add to the stock to thicken and stir well. Put the shanks back in the sauce to warm up.

Toast the spices and salt in a fry pan over low heat until they become fragrant and begin to crack. Remove and, using a spice grinder or mortar and pestle, grind the spice mix to a powder. Finely chop mint leaves and add to mix. Roll the warmed shanks through the spice mix ready to serve.

Cook the grains in separate pots of boiling salted water, like you would pasta, until they are tender. Strain in a colander and mix together.

Cook the garlic, onion and speck in olive oil in a large saucepan over medium heat for 7-10 minutes, stirring to make sure they don't catch on the bottom of the pan. Add all the grains and chicken stock and cook for a further 5-10 minutes to heat the grains.

To serve, tear the radicchio leaves and stir through the grains. Place the grains in a bowl, lamb shanks on top, and spoon over a little extra sauce.



Mike Eggert

After completing degrees in environmental science and wildlife management, Mike Eggert decided to train as a chef. Working with Martin Benn at Sepia, Kylie Kwong at Billy Kwong, Mat Lindsay at Ester and Daniel Puskas at Sixpenny, he learned the value of great Australian produce paired with strong technique. Pop-up dining collaborations with Jemma Whiteman led to their permanent restaurant Pinbone.

Wine grapes and global warming

Wine grape growing is Australia's largest fruit industry. Most production comes from areas with a favourable temperate or Mediterranean climate. Iconic grape-growing regions such as Margaret River in Western Australia, the Barossa and Riverland in South Australia, Sunraysia in Victoria and the Riverina in NSW will be the most affected by higher temperatures and lower rainfall, especially for red varieties such as Shiraz, Cabernet Sauvignon and Merlot. While conditions for wine-growing will improve in places like Tasmania, up to 70 per cent of Australia's wine-growing regions with a Mediterranean climate will be less suitable for grape growing by 2050.

Roast lamb with eggplant and tahini

A traditional Australian slow-roasted rolled lamb forequarter scented with Middle-Eastern flavourings gives this dish a fresh and modern feel appealing to all roast-lamb lovers.

Serves 4
Prep time 3 hours 30 minutes

Ingredients

- 2 kg boned rolled lamb forequarter
- 500 g kipfler potatoes
- 125 g tahini
- 245 g natural yogurt
- 120 ml lemon juice
- 1 eggplant, ends trimmed, cut in 1 cm slices
- 20 g butter
- 2 garlic cloves, sliced
- 150 g baby spinach
- 65 ml olive oil

Method

Preheat oven to 170°C. Secure lamb with kitchen twine. Place lamb in roasting pan and rub with 1 tablespoon of oil, then season with salt and pepper. Roast for 3 hours. After 2 hours, add potatoes to pan, roll in pan juices and cook for 1 hour or until golden.

Transfer lamb and potatoes to large plate and cover with foil to keep warm.

Place tahini in small food processor and, while mixing, slowly add 2 tablespoons of water until tahini thickens. Add yogurt and process until a smooth sauce forms. Transfer to a bowl, stir in lemon juice. Season with salt and pepper.

Heat 1 tablespoon of oil in a non-stick frying pan over medium heat. Cut eggplant, ends trimmed, into 1 cm slices and cook, a few slices at a time, until golden and cooked through; add more oil as required. Transfer eggplant to a tray lined with a paper towel.

Add butter to pan and, once melted, add garlic and cook for 30 seconds or until softened. Transfer garlic to a bowl. Add spinach to pan and cook for 1 minute or until wilted and cooked with butter.

Slice lamb. Place lamb, spinach and eggplant on a serving platter. Sprinkle with garlic and serve with tahini dressing and potatoes.

Eggplant and global warming

Eggplant, popularly used in cuisines from the Mediterranean to Asia, is known around the world by a variety of more exotic names including aubergine, melongene and brinjal. A species of nightshade, it is related to both the tomato and the potato. As a tropical perennial plant, climate change is likely to enable eggplant to be grown further south in Australia, in areas where frost currently limits production. However, high temperatures will lead to fruit drop, lower quality and malformed fruits.

Simon Bowen

Simon grew up in the Coonawarra region, did his apprenticeship with Stephanie Alexander in Melbourne, and worked overseas at Chateau Souverain in California and Kong Hans in Denmark. Returning to Australia, he worked with Alla Wolf Tasker at the Lake House in Daylesford. In 2006 he bought Pipers of Penola and has won Restaurant & Catering Australia's award for best regional restaurant in South Australia five times.

> Farmers are faced with the realities of climate change. It's not a philosophical idea to us; it's something we're seeing the impacts of every day.

Sheep and goats

Ashley McMurtrie, Cobar, NSW

I have no farming pedigree at all; I previously worked in Sydney as a builder and youth worker. We moved here in 2005 as a part of a family adventure. My wife Carolyn and I are keen travellers and, after seeing much of the world, decided we wanted our kids to grow up in the outback. My sons have such a wonderful amount of freedom growing up on a property this big. There are so few places left in the world that offer this opportunity.

Living in Sydney, we had also grown tired of talking about the environment without really participating in it. Farming allows us to do that; we have over 100 square kilometres here that our decisions affect.

I started farming goats. I didn't really have a choice. They were already here. Our area is overrun with wild goats. We then starting running Boer goats, which are a South African meat goat. We also breed Dorper sheep, mostly flock rams for other commercial sheep producers to buy, in order to improve the genetics of their flock.

When we first moved here, we were in the early stages of the Millennium Drought. We've been back in drought for two years now. Historically Cobar had a summer-dominant rainfall pattern but that's changed over the past 20 years. It's become very chaotic as to when it rains and the volume of rain. We've had virtually no rain to speak of since autumn.

It became apparent to us early on that, in order to be productive, we needed to come up with techniques to maximise isolated rainfall events. We started grazing in ways that give the pastures opportunity to recover and installed water-spreading banks, which maximise the amount of time water has to penetrate the soil.

One of the positive spin-offs of the work we've done is that it's having an oasis effect on the wildlife, particularly the birdlife. As conditions deteriorate elsewhere, the birds congregate on these areas of restored grasslands, as that's where there's feed. We've got two pairs of grey falcons living on our property now because of the security of the food. It's a huge buzz to see that.

Increasing climate variability just adds another risk to agricultural business. Farmers have to be pragmatic because we're faced with the realities of climate change. It's not a philosophical idea to us; it's something we're seeing the impacts of every day.

Peer-reviewed research on this property and others shows there are real opportunities to store carbon in the landscape and improve biodiversity. We can help solve climate change and create alternative sources of income. When governments fund research and development in this area we can make huge inroads.

Pork and global warming

Increased temperatures and more frequent heat waves are likely to increase heat stress for intensively produced livestock. Pigs are particularly sensitive to heat stress since they don't possess sweat glands (the phrase to "sweat like a pig" is a fallacy) so they have to get rid of excess heat through panting or wallowing in water or mud, which is not an option in most modern production systems. Heat stress is particularly serious for the modern lean, healthy pig due to its high metabolic rate, reducing the animal's food intake and production.

Crispy soy-roasted pork belly

Everyone loves pork crackling, and this recipe gives you the most amazing thick layer, which makes it perfect as part of a big banquet, such as with friends on Earth Hour night or at any other celebratory feast. The only problem is everyone will want to fight over the crackling. It's so good!

Serves 4
Prep time 2 hours, overnight in the fridge and 2 hours to cook

Ingredients

- 1 piece free-range boneless pork belly (800 g), skin-on and scored
- 500 ml water
- 1 tbsp sesame oil
- 1 tbsp salt flakes

Marinade

- 2 tbsp brown rice miso paste
- 1 tbsp five-spice powder
- 1 tbsp brown sugar
- 1 tbsp light soy sauce

Method

When buying your pork belly, get it with skin on and scored; you can ask your local butcher to do this.

Place the pork, skin-side up, on a wire rack over the sink. Pour boiling water over the pork to scald the skin; this is the most important step to ensure the skin crisps up into crunchy crackling. Pat rind thoroughly dry with a paper towel, then place pork, uncovered, in refrigerator for 2 hours.

Remove pork from fridge and place, skin-side up, on a chopping board. Using the tip of a sharp knife, stab the pork skin repeatedly until the surface is covered with holes, being careful not to go all the way through. Turn the pork belly over and make cuts about 2 cm apart and 1 cm deep.

Combine marinade ingredients in a bowl and mix well. Rub marinade evenly over the flesh side of the pork, not the skin, and massage well into the cuts.

Place pork, skin-side up, on a wire rack (this same rack will be used for roasting the pork, so make sure it is oven-proof and fits inside a roasting tin) and place over a tray or large plate to catch any drips. Place in refrigerator uncovered and leave overnight, during which time the skin will dry out. The drier the skin, the better the crackling when roasted.

The next day, bring pork to room temperature and preheat oven to 150˚C. Transfer pork and wire rack to a roasting tin. Rub skin well with sesame oil, then scatter salt all over. Roast for 90-120 minutes or until tender. To test, pierce the meat with a skewer – you should meet no resistance.

Increase the oven temperature to 220˚C and continue roasting for 15 minutes. This final blast of heat will crisp up the skin, turning it into crackling.

Remove pork from oven and allow to rest, uncovered, in a warm place for 15 minutes.

To serve, cut into 1 cm-thick slices.

Kylie Kwong

Kylie is proprietor of Sydney's celebrated Billy Kwong restaurant and a passionate advocate of sustainable food and ethical eating, using locally grown, organic and biodynamic produce. A supporter of the slow-food movement, she helps to nurture the next generation of cooks through the Stephanie Alexander Kitchen Garden Foundation and has developed a range of fair-trade tableware with Oxfam.

Stuffed tomatoes

There are many ways of stuffing vegetables but these stuffed tomatoes would have to be my favourite. This is a classic French way of making them and they always remind me of my mum, who makes them like nobody else. Be sure to use big, plump ripe tomatoes when they are at their best in summer.

Serves 8
Prep time 90 minutes

Ingredients

- 8 large ripe tomatoes
- 500 g minced pork
- 100 g minced beef
- 1 small red onion, finely chopped
- 1 clove garlic, finely chopped
- ½ bunch parsley, finely chopped
- 1 egg
- 2 tbsp olive oil
- 15 g butter
- salt and pepper

Tomato sauce

- 10 g butter
- 1 clove garlic, finely chopped
- 3 ripe tomatoes, chopped
- bouquet garni (1 bay leaf, 2 sprigs parsley, 2 sprigs thyme)
- salt and pepper

Method

Preheat oven to 180°C.

Use a knife to remove the tops of the 8 large tomatoes and then carefully spoon out the flesh, ensuring not to pierce the skin. Keep the tops. Reserve the scooped-out flesh to make the sauce.

In a bowl, mix the meats with the onion, garlic, egg, parsley and a good pinch of salt and pepper. Mix until all the ingredients are well combined.

Fill each tomato with the meat mixture and replace the tomato tops on each. Place in a baking dish, drizzle with olive oil and knobs of butter and bake for 45-50 minutes.

For the tomato sauce, melt the butter in a saucepan and gently cook the garlic. Add the reserved tomato flesh and the extra 3 chopped tomatoes. Season with salt and pepper and add the bouquet garni. Once the sauce has been brought to the boil, turn down to a low heat and cook slowly for 45 minutes. Blend with a stick blender.

Serve the stuffed tomatoes with sauce and either steamed rice or pasta.

Justine Schofield

After appearing as a contestant in the first series of *MasterChef Australia* in 2009, Justine Schofield has built a career out of everything she loves and become a familiar and well-respected face in Australian food media. She hosts the popular daytime cooking show *Everyday Gourmet*, runs a high-end catering company and writes a regular column for taste.com.au.

Tomatoes and global warming

Tomatoes are an annual irrigated crop grown across Australia, with Queensland and Victoria the largest producers. In some regions, hotter temperatures may allow for a greater number of cropping cycles per year, increasing production. However, fruit set may be reduced when temperatures are moderately above ideal levels, partly due to a reduction of pollen viability. Reliable water supplies will be increasingly important for tomato production but more difficult to guarantee.

Cauliflower and global warming

As with other brassica crops, cauliflower is a rich source of minerals and chemicals beneficial to health and may help prevent cancer. Cauliflowers grow better in cool conditions. Excess heat negatively affects head development and size, while increases in soil temperatures promote a major soil-borne disease, known as "clubroot", in brassicas. Rising temperatures may lead to cauliflower production shifting to cooler regions in Australia.

Barbecued pulled pork with cauliflower cream

I bought my first slow cooker around the same time I quit sugar. As I ventured into what was virgin territory, I found the easiest way to eat simply and sustainably was with this nifty kitchen device. A slow cooker is sustainable in every sense. It's super-economical, energy-efficient, convenient and makes things tastier. Cooking secondary cuts of meat, like pork shoulder, in a slow cooker can result in the most succulent, melt-in-the-mouth dish.

Serves 6-8
Prep time overnight and 4-8 hours cooking

Ingredients

1-1.5 kg piece of pork shoulder (preferably bone in) or neck
1½ tsp whole black peppercorns
2 tsp whole fennel seeds
3 tsp smoked paprika
3 tsp sea salt
1 tsp ground cumin
1 tsp all-spice or ground cinnamon
2 tsp ground chilli or chilli flakes
2 bay leaves
150 ml red wine or stock, any type
75 ml apple cider vinegar
2 tomatoes, chopped into quarters
2 cloves garlic, crushed

Cauliflower cream

½ head cauliflower, broken into small florets
160 ml cream
1 tbsp butter

Method

The night before, grind fennel and peppercorns with a mortar and pestle or blender. Add salt and other spices, except for the bay leaves, and mix.

Rub the lot over the meat, rubbing well into the fatty bits. Really get your fingers into the meat, massaging it all over. Place the lot in the slow cooker insert, then cover and place in the fridge for at least 2 hours, or overnight for a stronger flavour.

In the morning, place insert in the slow cooker and add rest of ingredients. Cook on low setting for 8 hours or high for 4 hours.

When the pork has 20 minutes to go, place the cauliflower, cream and butter in a saucepan, season to taste with salt and cook over low heat for 15-20 minutes. Once the cauliflower has softened, blend with a stick blender or use a potato masher until smooth.

Take out the pork, place on a dish and use two forks to "pull" the meat apart into shreds. Put the shreds back in the slow cooker for another 20 minutes, with the sauce. Continue cooking on high uncovered until heated through.

Sarah Wilson

Sarah is a blogger, television host and the author of the best-seller *I Quit Sugar* and related cookbooks. Her books and programs have helped hundreds of thousands of people to give up sugar. In a journalism career spanning 20 years across television, radio, magazines, newspapers and online, Sarah's former roles include editor of *Cosmopolitan* magazine and host of the first series of *MasterChef Australia*.

> What we'll have to adapt to is the heat extremes. Over 40 degrees is really stressful for a pig; the drop-dead kind of stressful.

Pork

Matt and Sue Simmons, Hawkesbury River, NSW

Our farm is about 80 kilometres west of Sydney. We run 110 free-range sows. It's all pasture-based from farrow to finish; from the time the piglets are born to the time they leave for the abattoir, they're outdoors on pasture.

It's a family farm, with just the two of us working the property. Our four children – Isabella, 14; Teale 12; Odelle, 10; and Tommy, who's six – help out where they can. They're the fifth generation to live here. Sue was born on the property. Her great-grandfather came here with his two sons, who were citrus farmers. We took over farming the property about 15 years ago. We pulled out all the citrus trees and started growing organic veggies. From there we moved into pigs.

Sue's very good with the food side of things, as she is a qualified chef. I'm a fitter and machinist by trade. It's a great combination, really. People ask me: "If you want to be a farmer, what should you go and learn?" I tell them to go and learn to weld. Especially if they want to farm pigs, because pigs break everything and it's handy to be able to fix it.

Every three weeks we wean pigs off the sows. I love weaning day. When you wean, you can see what you've produced for the past three weeks. Weaning is like a pig farmer's harvest. We go down to the paddock in the late afternoon – especially after a hot day when it'll be a bit cooler and the sun's starting to set – look out across the paddock and all the pigs are just out grazing. Little pigs are bouncing around. Everyone's doing their thing, just doing what pigs do. That's probably the best time.

The farming demographic of the Hawkesbury has changed a fair bit. Fifty years ago the Hawkesbury was the food bowl of Sydney. That sort of market has pretty well shrivelled up. The challenge is the pressure of urban sprawl. It has pushed a lot of people out, while more and more people who don't really understand farming practices are moving in.

In the past 10 years there's definitely been a change in weather patterns. Traditionally speaking, the Hawkesbury would flood on average every second year. We haven't had a flood for around 20 years. Floods replenish the moisture levels in the soil and keep the river healthy and flowing.

What we'll have to adapt to is the heat extremes. Pigs do not like temperatures over 25 degrees. Sows start to stress, so you've got to provide them means of cooling down. Over 40 degrees is really stressful for a pig; the drop-dead kind of stressful.

Kangaroos and global warming

Kangaroos are highly adapted to Australia's often dry, infertile country and highly variable climate. A female kangaroo is usually permanently pregnant except on the day she gives birth, with the ability to delay an embryo's development until the previous joey can leave the pouch. This strategy, called "diapause", regulates birth and growth rates according to conditions and resources. As a result, the supply of kangaroo as a sustainable food source can be highly variable. Meat quality is also likely to be poorer where climate change increases the incidence and intensity of stressful conditions.

Kangaroo with purple carrot, riberry & native pepper

The quality and taste of kangaroo can vary greatly according to breed, age and habitat, such as the amount of rainfall and the type of grasses the animals eat. I use red kangaroo sourced from the Paroo Darling region of NSW, where there is good summer rain and abundant native grassland on which kangaroos are free to roam and graze. With the animals being ethically handled, I appreciate cooking kangaroo as a sustainable eating choice.

Serves 6
Prep time 2 hours

Ingredients

1.2 kg kangaroo

Purple carrots

18 carrots
15 ml olive oil
2 bay leaves
150 g fresh riberries
salt and pepper

Pickled riberries

100 g brown sugar
100 ml red wine vinegar
60 ml water
80 g riberries

Riberry purée

2 brown onions
4 cloves garlic
50 g peeled ginger
500 g riberries
100 ml water

Carrot and riberry sauce

1 litre purple carrot juice
200 g riberries
250 g reduced veal stock
80 g riberry purée
40 ml red wine vinegar
2 bay leaves
3 g xanthan gum

Native pepper spice mix

50 g native pepper
30 g pepper berry
20 g black pepper
30 g juniper

Method

For the kangaroo loin, trim off excess sinew and cut meat into six 200 g portions, slicing across the centre of the loin and ensuring all pieces are even. In a large frying pan, sear the kangaroo on all sides until even in colour. Place for 2 minutes in oven heated to 180°C. Turn the kangaroo over and return to oven for another 1 minute. Remove from oven and rest in a warm place until ready to serve.

Wash carrots and place them in a bowl with the olive oil, seasoning and bay leaves. Wrap carrots in aluminium foil in a single layer with the bay leaves. Place on a tray and bake in oven heated to 180°C until just cooked. Keep warm, ready to serve.

For the pickled riberries, bring all ingredients to the boil in a small-sized pot, until the mixture reaches 112°C. Allow to cool for 10 minutes. Mix through the riberries and steep until completely cool. Set aside.

For the riberry purée, in a medium-sized saucepan, on medium heat, cook off onions, garlic and ginger. Add riberries and water and continue to cook for 5 minutes. Allow to cool. Place in an upright blender and blend until a completely smooth texture. Pass through a fine sieve. Set aside.

To make the carrot and riberry sauce, in a medium-sized saucepan reduce purple carrot juice and bay leaves by half (to 500 ml). Add reduced veal stock and riberry puree and bring to boil. Skim off any impurities. Add 200 g of fresh riberries, then slowly reduce by a quarter (to 600 ml). Adjust seasoning of sauce with 40 ml of red wine vinegar, then pass through fine sieve. Pour the sauce into a food processor, with xanthan gum, at a low stirring speed, allowing it to thicken.

For the native pepper spice mix, use a spice grinder to blend all ingredients and then pass through a fine sieve.

To assemble, place some sauce on plate with 8 pickled riberries. Carve each kangaroo cut into 3 pieces, place on sauce and then add carrots. Garnish with salad burnet.

Brent Savage

Brent is chef and co-owner of three highly regarded Sydney restaurants: Bentley Restaurant & Bar; Monopole; and Yellow. He has established a reputation for creating exciting and innovative dishes with a particular emphasis on contrast, using flavour and texture. His finely balanced cooking style combines modern techniques and the diverse flavours of Australian produce.

Beetroot and global warming

Considered in some quarters to be as iconically Australian as vegemite or lamingtons, beetroot grows best between 18-25˚C. Temperatures above 27˚C potentially cause bolting (prematurely running to seed) and poor colouring. High temperatures can cause light and dark rings to form in the root (zoning) that is undesirable for processing. High soil temperatures also increase the incidence of root disease, affecting beetroot quality.

Kangaroo loin, part smoked in lemon myrtle

This dish, with caramelised vegetables and a chocolate jus, is a favourite of mine. Those hesitant to try kangaroo have quickly changed their mind about it this after tasting this.

Serves 1
Prep time 30 minutes

Ingredients

- 1 kangaroo loin
- 200 g rice
- 200 g sugar
- 2 tbsp dried, ground lemon myrtle

Caramelised vegetables

- 2 pre-cooked baby beetroots, halved
- 2 pre-cooked baby carrots, halved
- 1 pear, quartered
- 1 handful baby spinach
- olive oil and butter for frying

Chocolate jus

- 2 tbsp beef jus
- 2 tbsp grated dark chocolate
- 1 tbsp redcurrant jelly

Seasoning

- pinch of nutmeg
- dill and parsley, finely chopped
- Murray River salt

Method

Mix the sugar, rice and lemon myrtle. Line a baking tray with foil and place the rice mixture in the bottom of the tray. Place a wire rack over the rice mixture, put the kangaroo loin on the rack and cover the roo and tray with a layer of foil.

Put the tray over a moderately high heat for 5-8 minutes, unwrap and turn the loin over, cover and repeat for 2-5 minutes. Remove the kangaroo and place on another tray in a warm place to rest.

To make the chocolate jus, combine beef jus, dark chocolate and redcurrant jelly in a pan and warm gently.

For the vegetables, heat a pan, add a little oil, beetroots and carrots and fry until lightly brown. Add the pear and cook until coloured. Season to taste and sprinkle with dill and parsley.

Heat a wok and quickly toss the spinach in melted butter until it has wilted. Season and add a pinch of nutmeg.

Plate the carrots, beetroot and pears, topping with spinach. Slice the loin and place on top of the vegetables; pour the chocolate jus around the outside. Season the kangaroo with Murray River salt and drizzle lightly with virgin olive oil.

Clayton Donovan

Clayton grew up on Gumbaynggirr and Bundjalung land on the north coast of NSW and learnt about native produce from his aunties and grandmothers. His international experience and understanding of native foods produces a unique contemporary cuisine with an indigenous twist. He gained a chef's hat from the *Australian Good Food Guide* in 2011 and is presenter of the ABC TV series *Wild Kitchen*.

> The farmers I talk with around here have gone way beyond debating whether climate change is real. We're all getting on with adapting.

Dairy

Marian Macdonald, South Gippsland, VIC

There's a big emotional tie to this place for our family. I don't think you can underestimate how much it gets into your blood. There's something about being out there, in the paddocks, that just settles my soul and makes me feel good about myself and my place in the world like nothing else can.

Even so, nothing prepared me for how tough it was to take on the farm after my father's death. Our family has been in the district since the 1840s, and my grandfather bought this particular piece of land as a soldier settler. Faced with the decision of whether to sell the farm, we fought very hard to hang on.

Our first child, Zoe, had just arrived and we were in the midst of drought, flanked by bushfires and under attack from pests. Zoe's now eight and we have another child, Alex, who's three, as well as a farm that is close to being back in shape.

My husband Wayne and I manage our herd of 260 milkers with the help of our treasured employee, Clarkie, and a team of advisors and local contractors. Milk from our farm is used to make Western Star butter and infant formula right here in Gippsland. Dairy is a very important part of the local economy and I can't imagine what our community would be like without it.

The farmers I talk with around here have gone way beyond debating whether climate change is real. We're all getting on with adapting. It's already having an impact on our cows, our farm and our ability to produce high-quality food at a reasonable price. The combination of less rain and warmer temperatures has changed the way we feed our cows as we can't grow as much grass as we once did. The differences in seasonal patterns has even meant moving the time of year the calves are born; climate change has shifted the cycle of life.

Aside from everything we've done to make the farm more resilient to increasingly volatile weather, we're looking to the long-term health of our environment. We plant at least 1000 native trees each year in line with our whole farm plan, for example, which ties in with our neighbours' efforts to create a landscape that is as healthy as it is beautiful.

Farmers and environmentalists are actually on the same side. We need to work together. I hope increased interest in animal welfare will build momentum for action too, when people realise you can't have happy animals if they're being roasted or frozen by the elements. If we're going to look after the creatures around us, we need to look after our climate.

Sage and cheddar biscuits

These biscuits are so simple to bake you can do them with the kids. Make sure you use a strong, bitey cheddar and freshly chopped sage to give your biscuits great flavour. Serve them with olives, cheese and salami, or simply enjoy them with a cuppa.

Makes 24 biscuits
Prep time 50 minutes

Ingredients

- 150 g butter, softened
- 225 g plain flour, plus extra for dusting
- 125 g sharp cheddar cheese
- 1 small handful of finely chopped sage leaves, plus extra to garnish (optional)
- ½ tsp cayenne pepper
- ½ tsp mustard powder
- pinch of salt

Method

Place all the ingredients except the whole sage leaves in a large mixing bowl and beat with a wooden spoon until the mixture comes together.

Transfer mixture to a clean and floured bench top, divide in half and roll into two logs about 3 cm thick. Wrap in plastic film and refrigerate for 30 minutes.

Meanwhile, preheat fan-forced oven to 180°C and line two large baking sheets with baking paper.

Slice the logs into discs about 1-2 cm thick and place on prepared baking sheets. Press a sage leaf onto a few biscuits, if desired.

Bake for 10-12 minutes until just slightly browned.

Indira Naidoo

Indira is one of Australia's most popular broadcasters, having hosted and reported for some of the country's most distinguished news and current affair programs during her 25-year journalistic career. A long-time foodie, Indira has in recent years focused on issues of food and sustainability. Her book *The Edible Balcony*, about urban farming, was published in 2011.

Cheese and global warming

Milk volume and quality for cheese production is likely to be affected by warmer temperatures and increased frequency of heat waves. Heat stress on dairy cows typically reduces milk yield by 10-25 per cent, and by up to 40 per cent in extreme heat-wave conditions. Such conditions also reduce the quality of pastures, leading to a decline in the quality of milk for cheese production. Lower-quality diets for dairy cows lead to changes in milk protein content and composition that reduce cheese yield and quality, and increase dependence on grain supplements.


SEAFOOD

Fried octopus, olives and mandarin

This dish is based on a traditional Roman technique for cooking octopus and then adding all the benefits of deep frying. It really highlights the flavour of the octopus as well as keeping it amazingly tender. It's a great snack to eat with your hands.

Serves 6 as snack
Prep time 2½ hours and overnight to dry out olives

Ingredients

- 250 g black olives
- 6 mandarins
- 250 g sugar
- 200 g butter
- 1 kg Fremantle octopus hands
- ½ bunch of thyme
- 500 ml vegetable oil
- salt
- 100 ml black vinegar

Method

Prepare the olives the day before. Remove the pits from all the olives. Take 200 g of the olives and dry in a low oven at 110°C overnight. Once these olives are dry, chop them finely and reserve.

Place the mandarins in a pot and cover in water, weighing them down with some baking paper and a plate just big enough to fit inside the pot. Simmer on a medium heat for about 10 minutes, until the mandarins are tender. Remove from the liquid and allow to cool.

Once cool, cut the mandarins in half. Cover a heavy-based pan with the sugar and place the mandarins face down. Add the chopped-up butter and any excess mandarin juice. Cook on a medium heat until the sugar has caramelised. Remove from heat.

Blitz the mandarin, sugar and butter mix in a blender on high speed until smooth. Pass through a fine strainer and chill in the fridge.

To cook the octopus, place in a heavy-based pot that has a tightly fitting lid and dress with a little olive oil, the thyme and remaining olives. Put the lid on the pot and cook over low heat until the octopus is tender, roughly 2 hours. Give the octopus a turn every half hour or so.

Once the octopus is tender, remove it from the liquid and chill it in the fridge. When the octopus is cold, cut it into individual tentacles and then cut the tentacles in thirds.

Heat the oil to 200°C in a deep pot. Fry the octopus until crispy, being careful as the oil may splash. Drain the octopus on a paper towel. Season well with salt.

To serve, place a large dollop of the mandarin purée on a plate and coat it with the dried olives. Arrange the octopus on the plate and dress to taste with the black vinegar. Dip the octopus in the mandarin and suck it down!

Mitch Orr

Mitch has worked in some of Sydney's best restaurants – Pilu at Freshwater, Sepia, Duke, 121BC and Buzo. In 2010 he won the Josephine Pignolet Young Chef of the Year award and travelled to Italy where he staged at Osteria Francescana. In 2014 he opened Acme in Rushcutters Bay, named by *Gourmet Traveller* as a favourite opening of the year.

Octopus and global warming

Four octopus species are commercially fished in southern Australia. Southern and gloomy octopus frequent seagrass beds, pale octopus live on sandy bottoms and maori octopus inhabit reefs and deep water. Females lay one clutch of eggs, care for them until they hatch, then die. All species span a wide temperature range, eat many prey types and are opportunistic, suggesting possible ability to adapt to warming, but computer modelling projections for pale octopus indicate warming could lead to eventual decline. Increased carbon-dioxide may make octopus more vulnerable to predators, and combined climate factors may have complex effects.

Sashimi salad with wasabi

This is the sort of sashimi salad a bloke could eat, with its strong, punchy flavours, heaps of freshness and sunny passionfruit dressing hit with the heat of wasabi. Great for lunch or a light meal.

Serves 4
Prep time 20 minutes

Ingredients

- 1 carrot, peeled and cut into matchsticks
- 2 tbsp rice vinegar
- 1 tbsp caster sugar
- 100 g silken tofu, drained
- 1 avocado, peeled and stoned
- 2 pink radishes, trimmed
- soft green lettuce leaves
- 200 g sashimi-grade salmon or ocean trout
- 200 g sashimi-grade fish such as tuna, Australian skipjack, bonito, whiting or trevally
- 1 handful of watercress sprigs
- 1 tbsp sesame seeds, white or black

Dressing

- 2 tbsp rice vinegar or lemon juice
- 3 tbsp extra virgin olive oil
- 1 tbsp sesame oil
- 2 tbsp passionfruit pulp
- 1 tsp sugar
- 1 tsp wasabi paste
- sea salt and black pepper

Method

To pickle the carrot, whisk the sugar and rice vinegar in a small bowl, add the carrot, toss well and leave for 20 minutes then drain.

Cut the tofu and avocado into 1.5 cm cubes and finely slice the radishes.

Tear the lettuce leaves into bite-sized pieces and arrange in piles on four dinner or salad plates.

Finely slice the fish and arrange on plate with the leaves, avocado, tofu, radish, and cress, aiming for some height. Top with the pickled carrot and sesame seeds.

Whisk the dressing ingredients together, and spoon over the top. Serve immediately.

Jill Dupleix

Jill was born on a sheep farm in country Victoria and taught herself to cook. She is a food columnist, restaurant critic, publishing consultant and the food curator of TEDx Sydney. Jill has been food editor of *The Sydney Morning Herald* and *The Age*, and cookery editor of *The Times* in London. She has authored 16 cookbooks, including *New Food, Old Food* and *Simple Food*.

Salmon and global warming

Atlantic salmon are farmed in pens in the cold waters around Tasmania. Growth is optimal between 7°C and 17°C, but the Tasman Sea is experiencing the greatest rate of warming in the southern hemisphere, with farms already near the upper limit in summer. Salmon deaths are often associated with amoebic gill disease, which can spread rapidly in pens as waters warm. Selective breeding may improve resistance, and seasonal forecasting of water temperatures reduce risks. However, the combined effects of warmer water, lower oxygen content and ocean acidification are likely to make salmon farming more difficult.

> As climate conditions change and as arable or productive land becomes more scarce, we're going to need to turn to the oceans for protein.

Salmon

Linda Sams, Hobart, TAS

I'm a marine biologist and environmental toxicologist. I became interested in aquaculture during school in the mid-1980s, when Jacques Cousteau was talking about the Blue Revolution and how aquaculture would feed the world.

I grew up in Canada on a terrestrial farm, so I already knew the impacts of farming and of starting to run out of arable land. I was interested in what aquaculture could mean for global food security. At that age of course, you're very starry-eyed, but I still believe aquaculture is going to be an important solution for feeding the world. It will be a very important part of food security for Australia.

Now I work as head of sustainability at Tassal, the largest producer of Atlantic salmon in Australia. This year alone we'll produce about 25,000 metric tonnes of salmon. All of our processing happens here in Tasmania and so does all our value adding.

We're an "egg to plate" operation. We grow our fish over a three-year cycle. Half the time is spent in freshwater, then once the salmon becomes a smolt it goes out into the marine environment. Both stages can be affected by climate change and both have different levels of intensity around energy requirements.

Salmon is well-recognised as a low carbon-footprint protein. It's one of the good news stories of aquaculture. We grow our salmon in a free-range marine environment which means there's less intensive farming involved and therefore less requirement for fossil fuels.

Fish are obviously at the mercy of the environment in which they're swimming around in. When you compare us to most global farming regions, we already grow our fish at quite warm temperatures so we're mindful of rising temperatures. We're also mindful of changed conditions in the marine environment which may mean different types of plankton, different types of jellyfish and changing water quality. That's why we plan well in advance, have diversified our farms and have six different growing regions to provide us with some surety and options.

I think it's important that Australia pays attention to its own backyard. We have to think about feeding people. Anything we can do to demonstrate how we adapt to changing conditions and still farm seafood successfully is very important.

As climate conditions change and as arable or productive land becomes more scarce, we're going to need to turn to the oceans for protein. I think it's a reasonable thing to do but of course we have to do it in a sustainable way, a way that's smart and responsible. That's been my focus for the past 10 years.

Seared scallops with corn purée

I love this dish because the flavour of the sweet corn purée and roasted scallops pair perfectly together and are balanced by the raisin vinaigrette, then finished by the textural crunch of the par-cooked cauliflower. Paired with a glass of riesling, I'm in heaven.

Serves 4
Prep time 30 minutes

Ingredients

- 4 cobs of fresh corn
- ¼ whole fresh cauliflower
- 500 ml chicken stock
- 1 tsp shallots, finely diced
- 3 tbsp olive oil
- 1¼ tbsp currants
- 1 tsp butter
- 1 tbsp full cream
- 16 scallops
- 2 lemons, juiced
- salt and pepper to taste

Method

Trim the cobs of corn to leave the fresh kernels. Cut the cauliflower into mini-florets and its stem into very thin slices.

In a pan, bring the chicken stock to the boil. Blanch the corn kernels in the stock for 10 minutes.

Bring a separate pan of water to the boil. Add a pinch of salt and blanch the cauliflower for 1 minute. Drain and set aside at room temperature.

Make the vinaigrette by mixing the shallots, 2 tablespoons of olive oil and currants together. Set aside.

Strain the corn and reserve the stock.

Place the corn in a blender with 1½ tablespoons of the stock, butter and cream. Purée, then pass the corn purée through a fine sieve.

Drizzle the remaining oil over the scallops. Heat a frying pan to a high heat. Add the scallops and oil to a smoking heat. Cook on one side for 30 seconds until it is brown and crispy. Turn over and cook on the other side for 30 seconds. Stay with the pan. You will see that the middle becomes cooked as you turn each one over. Do not overcook the scallops.

To serve, smear each plate with the corn purée. Top with the scallops and cauliflower florets and sprinkle the stems over. Spoon over the raisin vinaigrette.

Andy Allen

A former electrician, Andy's life was changed forever when he became the youngest winner of *MasterChef Australia* in 2012. He has continued his passion and learning as a chef at the renowned Three Blue Ducks in Sydney, and on his YouTube channel Andy Allen Cooks. His philosophy on food is all about flavour: the taste of what we eat keeps people coming back for more.

Scallops and global warming

Saucer scallops are fished (and farmed using sea-ranching) across northern Australia, while Southern scallops are fished in Victoria and Tasmania. Seas off south-east Australia are warming faster than anywhere else in the southern hemisphere. Together with associated changes in oxygen and food, this may mean Southern scallops could effectively disappear from our plates. Both Northern and Southern scallops will have to cope with more acidic seawater, which is likely to thin their shells, reduce their growth, survival and reproductive success, and make them less able to elude predators. We do not know how much scallops can adapt to future conditions.

Sour orange curry of scallops

This is a beautifully light, aromatic seafood curry from southern Thailand. I love the subtle taste of scallop meat that allows the flavours of tamarind, lemongrass and kaffir lime leaves to shine through. For a more substantial curry you could also use fish, squid, clams or even a combination. Serve with steamed Jasmine rice.

Serves 6 as part of a shared meal
Prep time 45 minutes

Ingredients

- 15 pieces of sea scallop meat
- 1 litre fish or chicken stock
- 4 tbsp curry paste (recipe below)
- 4 kaffir lime leaves
- ½ stalk lemongrass, bruised
- 5 tbsp fish sauce
- 4 tbsp caster sugar
- 4 tbsp tamarind
- 4 snake beans
- 6 baby corn
- 1 medium tomato

Curry paste

- 80 g dried chillies, soaked
- 50 g dried shrimp, soaked
- 42 g garlic
- 100 g eschalots
- 80 g tamarind

Garnish

- 6 betel leaves, shredded
- 2 long red chillies, julienned
- 25 g coriander leaves

Method

For the curry paste, soak dried chillies and dried shrimp separately in warm water for 20 minutes then drain. Blend garlic, eschalots and shrimp to a smooth paste. Continue to blend while adding the chillies and tamarind until it becomes a smooth consistency.

For the curry, bring stock to the boil, add paste and simmer for 2-3 minutes, add lime leaves and ½ stalk of lemongrass. Season with fish sauce, sugar and tamarind: it should taste sour, salty and sweet.

Keep simmering and then put in the vegetables. Simmer for a further 2 minutes, taste and reseason if necessary. Now add the scallops, just warming the scallop meat through.

Spoon into a serving bowl, stacking the scallops and vegetables in the middle of the bowl and add enough sauce to cover three-quarters. Garnish with shredded betel leaf, chilli and coriander high on top of the stack so you can see all the colourful ingredients and scallops.

Serve with steamed rice.

Louis Tikaram

Louis' passion for great produce began growing up in Mullumbimby on the far north coast of NSW. Food was a huge part of his heritage, with holidays spent in Fiji by his grandmother's side preparing traditional dishes. His formal training began at Longrain in Sydney under Martin Boetz, followed by working with Brent Savage at Bentley Restaurant and Bar.

Australians love their seafood. Wild-caught or farmed seafood can be a great choice for taste, for your health and for the environment. As with any other product, however, it's up to us to choose wisely when shopping. To be sure your seafood is sustainably sourced, ask your retailer to stock wild seafood certified by the Marine Stewardship Council (MSC), and farmed seafood certified by the Aquaculture Stewardship Council (ASC).

> I'm definitely concerned about the results of climate change because they could make or break us. Whatever the outcome it's something we all have to deal with.

Prawns

Ashley Lukin, Spencer Gulf, SA

I'm a third-generation prawn fisherman. We've got a family business and I fished alongside my father for 13 years. Now I'm the skipper of a boat with three deckhands.

I didn't always want to get into fishing. When I was younger I hated it. My father was always out there and never home, and I got seasick. Then towards the end of high school it just clicked; I worked out it was a good way to make a living and a good lifestyle. I still get seasick, though. So does Dad, actually, and he's being doing it 35 years.

We fish on average 50 nights a year, during November and December and then March through to June. We only fish over the dark of the moon, from sunset to sunrise. The moonlight has an impact on catch rates: the less light, the better. We harvest prawns, process on board and snap-freeze ready for sale. On average we catch 48 tonnes per vessel a year.

It's fairly stressful, the decisions the skipper has to make, balancing short-term harvesting with long-term sustainability and crew safety. We get paid a percentage of what we catch, so missing one night can put us behind for the whole year. Both the owners' and deckhands' livelihoods are my responsibility – that and keeping everyone safe.

As we only fish a week or two weeks at a time, I get time at home to spend with my three boys: Evan, Mace and Finn. Over the off-season I also get time to do another job. I oyster-farm. I love being out on the water.

We're still trying to learn about the effect of climate change, as our marine environment is highly complex. Western king prawns are a remnant tropical species. The reason they survive in South Australian waters is because the bays warm up during summer and you get an equivalent tropical temperature. That's when the activity happens. Potential increases in temperature may mean prawns will be active for longer. Prawns also grow very quickly when it's warm, so there could be more spawning. That's a positive outcome.

However, during spawning, eggs go through several stages in which they've got to work their way into appropriate muddy sentiments or seagrass beds. If it's too warm, they might grow too fast and not make it into the settling ground. There's a risk. It's difficult to identify the balance; it could go either way.

I'm definitely concerned about climate change because the results are unpredictable. They could make or break us. Whatever the outcome it's something we all have to deal with. It's definitely an issue for our generation.

Hanoi prawn cakes with table salad and nuac cham

These crispy cakes immediately transport me to the shore of West Lake in Hanoi, pagodas silhouetted against the setting sun. Like many Vietnamese dishes they are quite simple but served with an essential table salad of fresh herbs and crisp green vegetables. Mint, coriander, Thai basil and dill are used. Rocket and watercress can be also be used because of their peppery qualities.

Makes 20 prawn cakes
Prep time 30 minutes

Ingredients

- 50 g of prawns, fresh or unthawed
- 120 g plain flour, sifted
- 80 g rice flour
- ½ tsp salt
- ½ tsp baking powder
- 1 tsp sugar
- black pepper, freshly ground
- 220 ml water
- 150 g sweet potato
- 3 spring onions
- vegetable oil, for frying

Nuac Cham (dipping sauce)

- 3 small Thai bird's eye chillies
- 1 garlic clove, finely chopped
- 1 tbsp sugar
- 100 ml of warm water
- 2 limes, juiced
- 4 tbsp fish sauce

Table salad

- 1 lime
- ½ cucumber
- 1 handful of bean sprouts
- ¼ crisp lettuce, such as iceberg
- 1 bunch rocket or watercress
- 5 sprigs mint
- 5 sprigs coriander
- 5 sprigs Thai basil, or regular basil

Method

For the prawn cakes, de-vein the prawns and cut into 1 cm pieces. Combine the two types of flour with salt, baking powder, sugar and black pepper. Mix in the water until you have a smooth batter, leave to rest for 10 minutes.

Peel and cut sweet potato into matchsticks. Thinly slice spring onions.

Mix sweet potato, spring onion and chopped raw prawns into the batter.

In a heavy-bottomed pan, add a good amount of oil and heat to 180˚C. To test the oil is hot enough, drop in a little of the mixture: it should bubble and sizzle straight away. Test for taste and adjust seasoning as required.

Place two heaped tablespoons of the prawn batter onto a metal spatula, pat into an irregular shape about 1 cm thick, then push the mixture in the oil. Fry batches of three or four at a time, turning the cakes once until golden brown all over. Drain on kitchen paper.

For the nuac cham (dipping sauce), in a pestle and mortar crush 1 chilli, garlic and sugar into a wet paste. Add the warm water, then transfer to a bowl and add the lime juice and fish sauce, stirring to dissolve the sugar.

Cut the other 2 chillies into thin round slices, reserve a third of them for garnish and add the rest to the dipping sauce. Chopped ginger, fresh coriander, spring onions or thinly sliced carrot can also be added, along with chopped roasted peanuts, for the sauce to accompany other dishes.

For the table salad, cut the lime into quarters and half a cucumber into thin long slices. Wash the bean sprouts and lettuce and drain, then combine all the ingredients with rocket or watercress, mint, coriander and basil, and toss to serve.

To eat, wrap the prawn cake in a combination of some of the fresh herbs and make a parcel with a piece of lettuce. The whole thing can be dipped into the accompanying sauce by hand or using chopsticks.

Tom Kime

Tom is co-owner and chef at sustainable seafood cafe Fish and Co, Sydney. He has worked in famous restaurants in Sydney and London including Terence Conran's Le Pont de la Tour, The River Café and Rick Stein's The Seafood Restaurant. His fifth book, *Fish Tales*, includes stories and recipes from sustainable fisheries worldwide.

Prawns and global warming

Eleven prawn species are fished around Australia. Currents flowing down the east and west coasts are strengthening, producing much warmer temperatures and southerly shifts of many species. Tropical banana, tiger and king prawns may move further south, and NSW greasyback and school prawns could become more rare. Freshwater from severe storms will benefit some species but harm others. Warming may make prawns grow faster in farms, but diseases are likely to become more severe, and storms may destroy farm ponds. It is not yet clear how prawns will be affected by warmer, more acidic seawater with lower oxygen content.

Barramundi and global warming

Wild Australian barramundi are caught near northern river mouths, and these fish are also farmed in Queensland, NSW and South Australia. Barramundi live in rivers as juveniles then grow into males and migrate to estuaries to mate after rain. As they grow larger they turn into females. This life cycle means they will be affected by expected increased rainstorms, the changed timing of floods and nutrients carried down rivers, and the loss of mangrove areas due to future sea level rise and more frequent storms. Farmed fish should grow faster at warmer temperatures.

Barramundi in banana leaf

I love this dish because its depicts the Top End, using the iconic barramundi and the flavours of our multicultural community. It's a great dish for a crowd, and I have always found it to be very popular whenever I have cooked it for family and friends. Easily prepared beforehand, it can be baked, put on the BBQ or cooked on coals when out bush. The ingredients are easily found in supermarkets, with the banana leaves obtainable from Asian stores or good greengrocers.

Serves 4
Prep time 20 minutes

Ingredients

- 2 tsp vegetable oil
- 1-2 tsp sesame oil
- 65 g Thai red curry paste
- 4 large pieces washed banana leaf
- 4 fresh, thick barramundi fillets
- 70 g coconut cream
- grated palm sugar to taste
- 25 mm knob of ginger, finely sliced
- 1 tbsp fish sauce
- 1 lime, juiced
- 1 bunch fresh coriander, picked
- 1-2 long red chillies, sliced thinly
- fried shallots or garlic to garnish

Method

In a small saucepan, combine oils with curry paste. Fry 3-4 minutes until paste splits and becomes fragrant.

Cut four pieces of banana leaf, 40 cm square. Place on barbecue and heat until the leaves soften and change colour. Remove.

Place a piece of barramundi in the centre of the leaf and spoon a little curry paste onto the fish. Spread evenly. Fold banana leaf around fish to make a parcel, tie with kitchen string.

Place package on barbecue and for cook 6-8 minutes on each side. Vary the cooking time according to the thickness of fillets used. To test if done, insert a skewer or a toothpick into the thickest part of the package. There should be no resistance and the flesh should flake apart.

Meanwhile, combine coconut cream, palm sugar, ginger, fish sauce, and lime juice in a small bowl. Whisk to combine.

Serve fish topped with coriander, chillies and coconut sauce. Garnish with fried shallots or garlic.

Steve Sunk

For the past 15 years Steve Sunk has taken cookery courses to remote areas of the Northern Territory and Western Australia. His frequent travel between Indigenous communities has earned him the nickname "Walkabout Chef". David Hancock's *Northern Territory Seafood* features this and other recipes by Steve and fellow Darwin chef Jason Wilkes.

Stir-fried bar cod with snow peas

Stir frying is a fast, healthy way to enjoy a meal. The key is having your wok hot enough to stop ingredients from sticking. This stir fry is not a heavy dish so the flavours of the chilli, ginger and of course the fish come through, with the squeeze of lemon or lime giving it an extra zing. The tapioca covering on the crisp fried fish will also help the sauce thicken as you toss it through at the end. Enjoy.

Serves 4
Prep time 30 minutes, Cooking time 15 minutes

Ingredients

- 1.2 kg of bar cod or white-fleshed fish, cut into bite-sized pieces
- 230 ml coconut oil or canola oil
- 100 ml fish sauce
- 100 g tapioca flour
- 2 cloves garlic, minced
- 2 tbsp julienned ginger
- 8 snow peas, mange tout
- 1 red chilli, seeded and roughly chopped
- 2 spring onions, cut into 2.5 cm lengths
- 5 garlic chive flowers
- 2 stalks Asian celery, cut into 2.5 cm lengths
- 50 ml Chinese cooking wine
- 2 tbsp oyster sauce
- 50 ml fish sauce
- 2 tbsp caster sugar, super-fine
- 100 ml chicken stock
- ½ lemon, juiced
- 1 tsp salt and pepper mix
- 1 large handful of coriander leaves

Method

Heat the oil in a wok until just smoking.

Toss the fish in the fish sauce, then roll in the flour.

Shallow-fry the fish in the wok until golden brown, then remove from the oil with a slotted spoon and drain on absorbent paper. Set aside.

Drain off the excess oil, leaving 50 ml in the wok. Add the garlic and ginger and fry until fragrant. Add the snow peas, chilli, spring onions, garlic chives and celery, and stir fry for 2 minutes, then add the fish.

Deglaze the wok with Chinese cooking wine and add oyster and fish sauces, sugar and stock. Toss through and taste for seasoning; it should be salty and sweet. Add the lemon juice and salt and pepper mix.

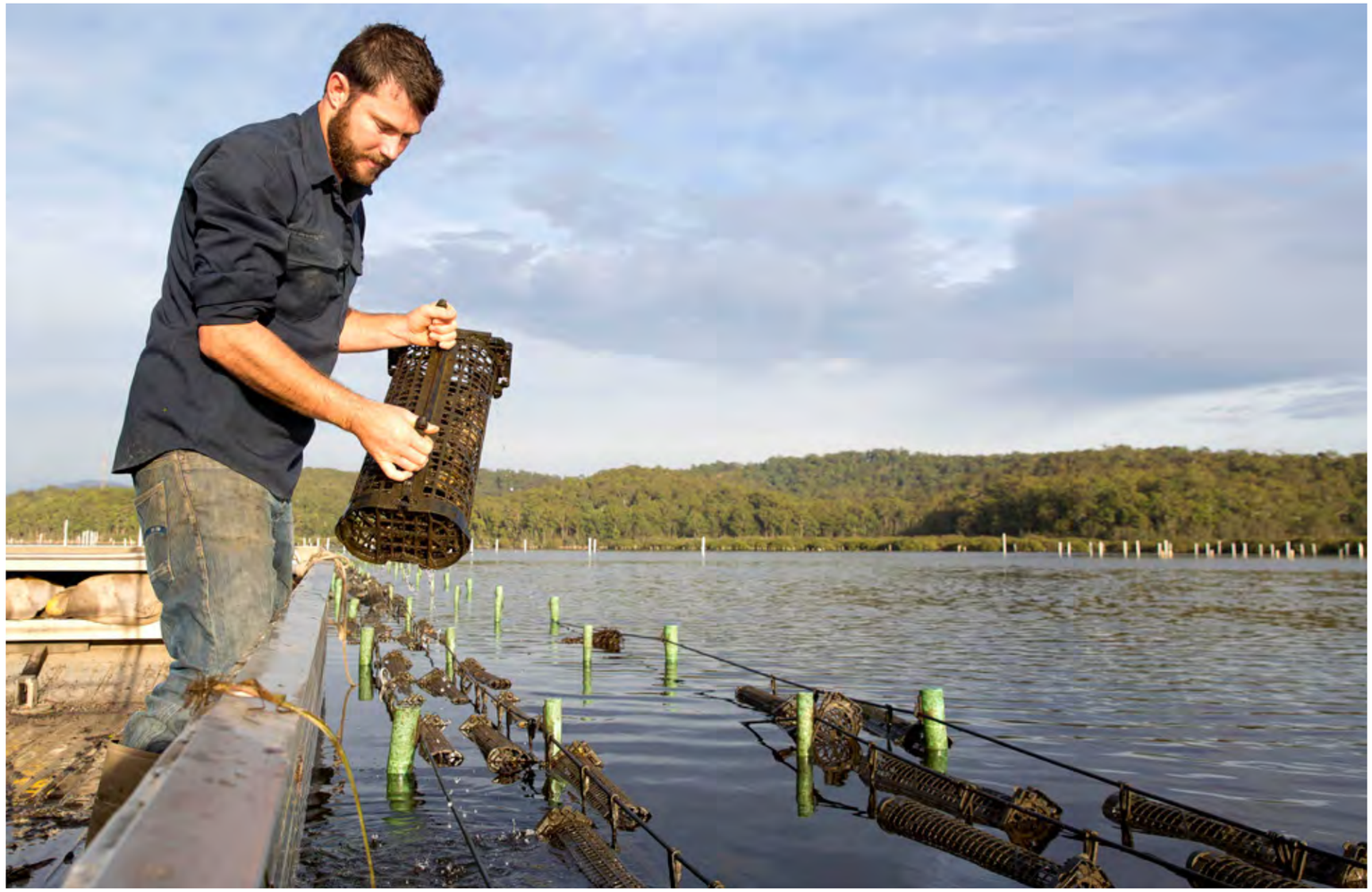
Toss through half the coriander leaves and spoon onto a serving plate. Garnish with the rest of the coriander and some extra lemon wedges.

Martin Boetz

Martin, a recipient of numerous chefs hats, has a reverence for fresh ingredients. Part of the Australian food scene for more than 20 years, including 15 as executive chef at Longrain, he has established "The Farm" at the Cooks Co-op in Sackville, NSW. Focused on sustainable farming and education, this agricultural project encapsulates Martin's vision of chefs having control over their produce.

Cod and global warming

The bar cod, or banded rock cod, is a deep-water fish with a wide distribution, coping with water temperatures from southern NSW to northern Queensland, so should not be much affected by higher temperatures, and may extend further south. But it may be affected by decreases in oxygen and increased acidity expected due to climate change. We have little information on how severe these effects may be.



> I'm really relying on people to put a value on the environment so I can maintain a living into the future.

Oysters

Ewan McAsh, Clyde River, NSW

It was my father's suggestion to go into oyster farming. I looked into it and said it wasn't a bad idea. A week later he quit his job, bought an oyster farm and invited me to come work it with him. We had no experience in farming or business. He'd been in the local government for 25 years and I'd just come out of university. We were fairly naive. I thought we'd work twice as hard as the older people we took the farm over from and we'd make twice as much money. It's not as easy as that. It's been challenging but rewarding.

We've been farming for 10 years now. We've got a 20 hectare farm, with four to five million oysters out in the water at any one time. We grow three species: Sydney rock oyster, Pacific oyster and Angasi flat oyster.

It's a really sustainable industry. We don't have to feed or treat the oysters, they grow naturally in commercial quantities in the river system. We've converted the farm over to modern cultivation techniques using recycled plastic infrastructure. It's very environmentally friendly and sustainable in terms of impact and need for replacement. I also established the Ulladulla Oyster Bar, an oyster and wine bar to retail all our product.

There's huge demand for oysters both domestically and overseas. We've got big plans for the future. As we've converted to a sustainable operation, I want to grow to a scale and capacity that means I can sell oysters to the world.

We used to get fairly catastrophic flood events but haven't had them in 20 to 30 years. We've been in more of a drought. That means the rivers get silted up, don't get flushed out and that affects the health of the oysters. It's a bit of a mixed bag: oyster farmers hit by catastrophic rain events obviously have their leases and livelihoods damaged but it means the estuary ends up being more productive afterwards. In our case, we think our productivity is going down because the estuary's getting clogged up.

Oysters are exposed at low tide, so rising temperatures will affect oysters in the sun. Droughts are terrible because the oysters need that influx of fresh water and nutrients to feed on.

Of all farmers, I'm probably the the most impacted by climate change or environmental pollution; everything runs into the water. We're reliant on good environmental practices elsewhere. Even with our cultivation systems, you can only do so much; then it really comes down to what's happening in the rest of society and the world. I'm really relying on people to put a value on the environment so I can maintain a living into the future.

Oysters and global warming

Higher temperatures, more rainstorms and more acidic seawater are predicted in estuaries, where oysters are farmed. Oyster larvae grow more slowly and die faster under these conditions but recent work suggests they may be able to adapt as climate change intensifies. Oyster parents exposed to more acidic water produce larger, faster-growing larvae, and selective breeding of oysters has resulted in larvae that survive better. However, other work shows that even with a chance to adapt over time, oyster shells are likely to be thinner and thus weaker, and that future conditions may reduce oysters' resistance to diseases.

Steamed striped trumpeter with oysters, sea lettuce and wakame butter

This dish focuses on the area surrounding southern Tasmania. In my opinion, its marine life and sea vegetation are second to none. Most of the ingredients for the dish can be sourced from the local area. The preparations of each ingredient are simple and all complement each other very well.

Serves 4
Prep time 30 minutes

Ingredients

- 4 portions Tasmanian striped trumpeter, 125 g each, skin removed
- 8 St Helens Pacific oysters, removed from shell
- 1 egg yolk
- 140 ml grapeseed oil
- 10 ml lemon juice
- 125 g unsalted butter, softened
- 60 g sea lettuce, chopped roughly
- 12 g dried wakame, powdered in a blender
- 3 g salt
- 30 g eschallot, sliced
- 100 ml sparkling white wine
- 250 ml fish stock
- salt for seasoning

Method

Place oysters and egg yolk in a blender and blend until smooth, slowly adding the oil. Add lemon juice and blend for a further 20 seconds. Remove and strain through a fine mesh strainer. Refrigerate until required.

In a bowl, whisk the butter until it starts to lighten in colour then add the chopped sea lettuce, wakame powder and salt. Mix together. Refrigerate until required.

Season the fish with a little salt and then place into a bamboo steamer that has been lined with greaseproof paper. Steam for about 10 minutes or until cooked through.

Combine the eschallot and wine in a saucepan and reduce down until the wine is nearly dissolved. Add the fish stock and reduce to about 100 ml.

To finish the sauce, cut the butter mix into large cubes. Bring the stock back to a simmer and whisk in the butter. Adjust the seasoning if required.

Clayton Wells

Clayton started cooking in 2001. Following his apprenticeship he worked in the kitchens of Quay and Tetsuya's in Sydney, then moved to London in 2009 to work as sous chef to Nuno Mendes at The Loft Project and Viajante. He returned to Sydney in 2011 to work at Momofuku Seiobo. Automata, his first restaurant, is opening in Chippendale in 2015.

Coorong yellow-eye mullet with squid, pearl balls and red date infusion

Mullet is a much-maligned name for fish in Australia – much harder to sell than the more glamourous snapper, blue-eye trevalla or even farmed barramundi. The MSC-certified Coorong yellow-eye mullet is an outstanding fish of fine texture and superb flavour that will always be on Rockpool's menu.

Serves 4
Prep time 2 hours

Ingredients

4 mullet fish
1 medium-sized squid
salted wakame
salted jellyfish
7 onions
bronze fennel

Red date infusion

1 red onion
2 red capsicums
6 sauce tomatoes
8 tbsp mushroom soy
80 g yellow rock sugar
50 red dates
small handful of liquorice root
6 dried shiitake mushrooms
2 litres of water
6 tbsp tapioca pearls

Pearl balls

340 g white fish, chopped
2 scallions, sliced
1½ tsp minced ginger
1 egg
1½ tbsp cornflour mixed with 2 tbsp water
2 tsp light soy
1½ tsp Shaoxing wine
1 tsp sesame oil
2½ tsp sugar
1 tsp salt
glutinous rice, soaked for three hours

Lettuce rolls

1 head of Iceberg lettuce
hazelnut oil
20 g chopped red chilli

Compressed Apple Dice

simple syrup with 100 ml water
30 ml water with 0.3 g ascorbic acid powder

Method

For the red date infusion, toast onion, capsicums and tomatoes until caramelised. Transfer to take-away containers and put on lids to trap the steam so juice collects. Pass the juice into a small pot, add rest of infusion ingredients and bring to a simmer. Leave on side of stove to infuse for two hours then pass through a fine chinois. Bring liquid back to a simmer. Add six tablespoons of tapioca pearls, simmer and puree with stick blender until smooth. Season with salt and red date vinegar.

For the pearl balls, mix all ingredients except rice, roll into balls, coat with rice and steam for 10 minutes.

For the lettuce rolls, blanch lettuce in salted water until soft, refresh in iced water until cold, drain well. Use three leaves in each roll: roll one leaf and top with chopped chilli. Roll the other two leaves around it, then wrap in cling film. When needed, steam for 4 minutes, unwrap, dress with hazelnut oil, season with salt, then char with a blow torch.

Remove squid guts and tentacles, peel inside and out, cut into four strips and score, then grill on Japanese BBQ until just cooked. Grill mullet fillets over bull rushes, brushing with butter.

Rinse wakame under cold water to hydrate and remove excess salt. Rinse jellyfish then pour boiling water over it until it shrinks by half.

For onion stock, slice 3 onions very finely, season with salt and sugar, cover in a pan with a cartouche and lid, and leave on a very low heat for a few hours to release all moisture. Push onions through a fine chinois to extract as much liquid as possible.

Roast 4 onions on a bed of foil for about 2 hours in a hot oven until they start to burn. Allow to cool, then remove burnt layers to leave the hearts.

Dice apples, no skin, straight into ascorbic water then compress at high pressure in a vacuum bag.

To assemble, reheat roasted onions in onion stock, add jellyfish and wakame. Place onion on plate, top with wakame and jellyfish. Put lettuce roll against onion. Place pearl balls either side. Place mullet beside onion and squid on top. Garnish with bronze fennel. Pour two tablespoons of red date sauce over garnish.

Phil Wood

Phil heads the kitchen of Sydney's flagship Rockpool restaurant. As a junior sous chef at Tetsuya's, Wood won the Sydney Morning Herald Good Food Guide's Josephine Pignolet Award for best young chef in 2007. He spent two years at Thomas Keller's The French Laundry in California. He joined Rockpool as head chef, becoming executive chef in 2010.

Yellow-eye mullet and global warming

Yellow-eye mullet live along the temperate and cold-water coasts of Australia and New Zealand. They are omnivorous and can cope with large differences in sea temperature. They grow faster in warmer waters and have a wide tolerance for salinity, so may be relatively resistant to climate change. But the bays and inlet habitats where juveniles live could be affected by more severe floods and droughts. Projections of lower oxygen content in water and increases in water acidity and temperature will negatively affect them. More acidic water conditions may, for instance, make mullet less able to smell predators.

FRUITS AND SWEETS

Sugar cane and global warming

Sugar cane is grown in Australia from northern NSW through to far-north Queensland. As a tropical plant, with optimum growth between 32-38°C, rising temperatures associated with climate change are unlikely to reduce yields dramatically. The heat may even favour southern regions. However, temperatures above 38°C reduce the rate of photosynthesis and increase respiration, leading to less accumulation of sugars. In addition, as most of Australia's sugar cane is grown on coastal flats, sea-level rise and salt-water flooding through cyclone-induced storm surges will pose a major risk to production by 2050.

Caramel and olive oil shortbread

This is a sophisticated take on a fabulously transportable slice you will love. You will never look at caramel slices the same way again. The slightly salty olive oil shortbread adds a grown-up element that makes the caramel pop. Included is also a trick for tempering chocolate.

Serves 15-18
Prep time 2 hours

Ingredients

Shortbread

- 115 g unsalted butter
- 100 g caster sugar, super fine
- 125 g plain all-purpose flour, sifted
- 50 g almond meal
- ½ tsp salt
- ½ vanilla pod, seeds removed
- 25 g olive oil
- 1 egg yolk
- 200 g dark eating chocolate, for topping

Caramel

- 375 ml can of evaporated milk
- 250 g unsalted butter
- 125 g demerara sugar

Method

In a large bowl, cream the butter and sugar together. Stir in the ingredients. Mix in the vanilla seeds, olive oil and egg yolk. Form the dough into a ball and refrigerate for 20 minutes. Preheat the oven to 160°C.

Roll out the dough between two sheets of baking paper to 5 mm thick. Transfer the dough into a large loaf tin, leaving about 5 cm of paper above the top of the tin on two sides so you can lift out the finished shortbread for cutting. Trim the sides of the dough so it fits neatly on the bottom. Remove the top layer of baking paper.

Prick the dough numerous times with a fork and then bake for 30 minutes. Check the dough while it is baking. Remove the tin from the oven and allow to cool slightly. Keep the shortbread in the tin.

Combine the evaporated milk, butter and sugar in a saucepan and bring to the boil. Turn the heat down and let the mixture simmer for about 10-15 minutes. Stir constantly as it thickens. Scrape down the sides and keep on stirring. Make sure the whole surface area has been stirred in. After 25 minutes the caramel will be thick and glossy and will set on the spoon. Pour it over the shortbread and smooth with a palette knife. There should be about 2 cm of caramel on top of the shortbread.

Melt the dark chocolate in a double boiler until just melted. If it is already tempered (snapping when you eat it), don't go over 31°C. When you melt the chocolate, it will stay tempered. Pour the melted chocolate over the caramel, shaking the tin so all the caramel is covered. Leave in the refrigerator for about 10-15 minutes to cool and set.

Pull the shortbread out of the tin using the baking paper at the sides and lift it onto a chopping board. Trim the edges of the slice and cut it into 2 cm squares. Make sure you wipe the knife after each slice.

Emma Dean

Emma is a cook, forager and author. She was the winner of the 2013 series of *MasterChef Australia*. Her first cookbook, *A Homegrown Table*, published in 2013, is a collection of more than 100 recipes that express Emma's hobby-farm origins and her passion for local, seasonal produce.

Lemons and global warming

Lemons are grown commercially throughout the Australian mainland and are the dominant citrus crop in central NSW and the Northern Territory. Lemon trees flourish in warmer, sunny climates with mild winters so will potentially cope better than other crops with a changing climate, provided they have enough water. Their optimum temperature range is 25-30˚C. Temperatures over 37˚C can cause trees to shed fruit too soon, reducing yields. In the southern states shifting production further southwards is less of an option, since lemon trees are frost-sensitive, with spring frosts a particular risk if trees have flowered due to warmer winters.

Rizogalo (Greek rice custard)

This is a recipe from my childhood made by both my grandmothers and my mother. The creamy texture created by the Arborio rice and that unmistakable taste of cinnamon is what brings this recipe to life for me. Making it recreates the aroma I so clearly remember when coming in the door from school with my sisters. We would run to the kitchen to inspect the bowls with scientific precision to see which had the most. This is one of those dishes that serves you up a big hug every time you eat it.

Makes 8-10 bowls
Prep time 60 minutes

Ingredients

- 250 g Arborio rice or long grain rice
- 1.75 – 2 litres milk
- 1 cinnamon stick
- skin of half a lemon
- 1 tsp vanilla essence or vanilla pod
- 2 tbsp brown sugar or honey
- 2 eggs optional
- cinnamon powder

Method

Put rice, milk, cinnamon stick and lemon skin in a pot and bring to boil, then ease back to low heat and allow to simmer. Stir to prevent sticking and observe, stirring from time to time. As the mixture slowly thickens with the release of rice starch, be sure to continue to stir and observe. This will take about 30 minutes.

Continue until rice is cooked and the mixture has thickened. If it thickens before the rice is cooked, add a cup of milk and keep stirring.

Beat two eggs and add vanilla essence in a separate bowl. Add 250 ml milk and beat together, then add some of the rice mixture to the egg mix, being sure to beat immediately so it does not cook the egg. Add a cup of the liquid/rice mix and beat well, then add this to the main pot and stir in well. Once mixed in it is ready to serve.

To serve, place thickened rice custard mix into bowls and sprinkle cinnamon over the top.

The dish can be eaten warm or cold. You can add some fresh fruit cut over the top. For a contemporary edge, add some ginger into the rice when boiling to get that little bit of back zing.

Costa Georgiadis

Costa loves growing stuff, and sees the connection between food, family, community and health as the most important bond worth upholding. Costa burst onto TV screens in the TV show *Costa's Garden Odyssey* and now hosts the ABC's *Gardening Australia*, where he shares his belief that simple individual daily actions can help regenerate the global garden we all rely upon.

Banoffee pie

This recipe is dedicated to all the tremendous banana and macadamia nut farmers. It was inspired by a visit to Queensland farmer Steve Lizzio and learning of the hardship banana growers faced with crops wiped out by cyclones. Chocolate-coated macadamias add a sweet and crunchy touch.

Serves 8 slices of pie or 10 mini tarts
Prep time 40 minutes

Ingredients

- 1 tin condensed milk
- 7 small ripe bananas
- 155 ml milk
- 5 tbsp caster sugar
- 80 g toasted Australian macadamias
- 1 pie crust or tart base, or several small ones
- 400 ml double cream
- 1 block dark chocolate
- 1 block white chocolate
- handful of chocolate-coated macadamias

Method

Boil condensed milk in the tin (without opening) for 4 hours. Alternatively, use ready-made dulce de leche.

Blend 3 bananas with milk using a hand-held blender.

In a medium saucepan over high heat, melt the caster sugar without stirring until it forms a dark caramel, then add the blended bananas and whisk until combined. Add toasted macadamias.

Pour mixture into pie crust or tart base and allow to set in refrigerator for at least half an hour.

Whip cream until it makes soft peaks and then slowly fold in the condensed milk.

Peel and slice remaining bananas. Arrange half the banana slices over the top of the pie, then smooth cream over the top. Do this twice to make two layers.

You can caramelise the bananas using a kitchen blowtorch. Shave dark and white chocolate on top and garnish with chocolate-coated macadamias.

Miguel Maestre and Amanda Duval

Miguel co-hosts Network Ten's lifestyle program *The Living Room*. He has worked in some of Sydney's premier kitchens and in 2010 opened his first restaurant, El Toro Loco, indulging his passion for Spanish cooking. Queensland-born Amanda is a news and weather presenter on Ten. A nature lover to the core, she is proud to be an Earth Hour ambassador.

Bananas and global warming

Up to 85 per cent of Australia's bananas come from the north Queensland coastal region. This area is exposed to tropical cyclones which can destroy large portions of banana crops, as occurred with Cyclone Yasi in 2011. Future changes to tropical cyclone activity in north-eastern Australia are somewhat uncertain. Studies, supported by recent historical analysis, have projected that climate change may lower the frequency of cyclones but increase their intensity, leading to greater crop and infrastructure damage when cyclones do develop.

> We were hit in 2006 by Cyclone Larry and then by Cyclone Yasi in 2011. So in the space of five years we were wiped out twice.

Bananas

Steven Lizzio, Silkwood, QLD

Far North Queensland is the heartland where bananas are best grown. Fifty-two weeks of the year banana crops are rotating and fruit is going out to consumers.

Here at Liverpool River Bananas we grow Cavendish bananas, the variety which makes up 90 per cent of Australian production. We've got 45 hectares, which is by no means a big banana farm for up here but certainly an average size.

It's a family-run business; myself and my mum and dad. We originally started out as sugar-cane farmers back in the day, but Dad's been farming bananas now for more than 30 years. Bananas are our livelihood.

Our staff is made up of seven local workers and then backpackers who come through. Because we're not an overly big farm who can push ourselves around, we have to make sure the job we do is number one. Being a family-run operation keeps our passion there. It rubs off on the staff and that's what we try to maintain. It's a little bit more close-knit; you know your workers more personally and you tend to run a more efficient business.

We were hit in 2006 by Cyclone Larry and then in 2011 by Cyclone Yasi. So in the space of five years we were wiped out twice. A 100 per cent knock-out. With Cyclone Larry, of course you didn't want it to happen, but you thought to yourself: "It's been 20 years since our last major cyclone, it had to come." Five years on, we wouldn't have thought we were going to get hit with something even bigger. Cyclone Yasi was hard to swallow. It was a bit unprecedented. It was a lot more intense and did a lot more damage.

The amount of water you get after a cyclone cuts into your property big time. It takes away headlands, riverbanks and soil. I'm talking heaps of soil; an acre of land was probably shifted out into the sea just from these flood events. We've rebuilt them all off our own backs. We've grown trees and grass to try to keep the headlands sturdy.

To cop two wipeouts, it hurt. It tests you and makes you think. But that's what makes banana growers in this area pretty resilient. You get knocked down, but it's your livelihood, you just have to keep battling on. It's at our own risk. That's farming really; you get what's thrown at you. But the severity of these cyclones is something that shocked us a bit. We could do with a break now.

Apples and global warming

Apple trees need cool conditions for effective fruit set. This requirement may not be met in the future in all current growing regions. Very hot conditions during the maturation period (January to April) can lower yield and quality. As little as 10 minutes of extreme sunlight is enough to cause penetrative burns through apple skin, so with climate change expected to increase the number of days hotter than 35°C in fruit-growing regions such as the Goulburn Valley, higher rates of sun damage are likely. Adapting farm practices, such as using shade netting, will add to production costs.

French apple tart

The French like their apple pies with one crust of pastry baked blind and then filled with a thick apple puree, which is topped with thinly sliced apples and finished with apricot jam glaze. The result is both pretty and delicious.

Serves 6
Prep time 1 hour

Ingredients

Apple tart

- 1 quantity sweet flan pastry
- 6-8 medium cooking apples
- 1 tbsp water
- 110 g caster sugar
- 60 ml brandy or 2 tsp vanilla essence
- 30 g butter
- 1 tsp lemon juice
- 1 tbsp sugar (extra)

Apricot glaze

- 125 ml apricot jam
- 1 tbsp water

Method

Preheat the oven to 190°C. Line a 20 cm flan tin with pastry, then prick well and chill until firm. Line with baking paper, half-fill with pie weights or dried beans and bake blind for 10 minutes. Remove the paper and beans. Reduce the oven temperature to 180°C and bake for a further 5-10 minutes or until the crust is pale golden. Allow to cool.

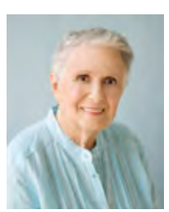
Reserve two or three apples for the top of the tart. Peel, core and quarter the others. Slice roughly and put into a saucepan with the water, sugar, brandy or vanilla and half the butter. Cover and cook over a gentle heat for about 20 minutes, stirring occasionally, until tender.

Increase the heat and boil, stirring, until thick enough to hold in a mass in the spoon. Push through a sieve if necessary. Taste and add more sugar if the apple is not sweet enough. Spread in the cooled pastry shell.

Peel and core the reserved apples and slice very thinly. Sprinkle with lemon juice and extra sugar. Arrange the slices in a pattern on top of the cooked apple. Melt the remaining butter and brush over the apple. Bake for about 30 minutes or until the apples are tender and browned lightly.

For the apricot glaze, heat the jam and water in a saucepan over low heat and stir until dissolved. Pass through a sieve, then return to pan and bring to the boil. Cook gently until the glaze is clear and a thick but spreadable consistency is obtained.

Slide the cooked tart onto a wire rack or serving dish and brush the top and pastry with the apricot glaze. Serve the tart warm or cold with a bowl of whipped cream.



Margaret Fulton

Margaret is one of Australia's leading and best-loved cookery experts. The matriarch of Australian cooking, she has been credited with transforming the way Australians eat. Margaret has been named a Living National Treasure by the National Trust and nominated by panel of experts convened by *The Sydney Morning Herald* as one of the 25 Australians who have most changed the nation.

Honey and global warming

A wide range of plants, including key food and pasture crops, produce commercial quantities of nectar. Apiarists target different flowering plants and seasons to produce honey of varying flavour and quality. Horticulture also depends heavily on insect pollination to maximise yields. While honey bees can withstand high temperatures and closely regulate their hive's temperature to between 34˚C and 35˚C, in extremely hot weather they gather water rather than nectar to keep the colony cool, reducing the quality of honey generated. Climate change will alter the areas that different honey bees live in and the seasonality of their food plants, altering synergistic and competitive relationships with other species.

Lemon verbena parfait

This dish was inspired by harvesting my own honey from the rooftop of The Four in Hand Hotel in Paddington, Sydney. The dish is a summer plate for any time of year; fresh, rich and sweet. As the seasons progress, the dish becomes more complex with the honey getting richer and more flavoursome.

Serves 10
Prep time 1 hour and minimum 3 hours to freeze

Ingredients

- 2 litres pouring cream
- 500 ml milk
- 200 g lemon verbena, finely chopped
- 200 g caster sugar
- 200 g liquid glucose
- 14 egg yolks

Apple and ginger juice

- 3 Granny Smith apples, roughly chopped
- 3 cm knob of ginger, roughly chopped
- 150 ml clear apple juice
- lemon juice and salt, to taste

Method

Combine cream, milk and 150 g of the lemon verbena in a large saucepan. Verbena is a herb that can be grown in the home garden, but it can also be sourced from specialist produce suppliers. Lemon verbena is the type used in cooking and tea, and as the name implies, has a lemony flavour and fragrance.

Bring the mixture to a simmer, then turn off the heat and leave it for 20 minutes to infuse.

Reheat gently, and stir in the sugar and glucose until dissolved. Whisk the egg yolks in a bowl. Strain the cream mixture and while still hot pour onto the egg yolks, whisking constantly. Pour into a clean saucepan and add the remaining lemon verbena.

Stir over very low heat until the mixture coats the back of the spoon. Then pour into a bowl sitting on another bowl filled with ice, to stop the cooking. Stir often to release the heat, then place into the fridge until chilled. Churn in an ice-cream machine according to manufacturer's instructions. Transfer to a large shallow tin (or several smaller tins) and freeze until firm.

For the apple and ginger juice, combine the apples, ginger and apple juice in a blender, and blend until smooth. Pass through a fine strainer and add lemon juice and salt to taste. Refrigerate until chilled.

To serve, turn the parfait out of the tin and cut into slices. Spoon some apple and ginger juice into the serving dishes. Add a slice of parfait and garnish with honeycomb and sorrel leaves.

Colin Fassnidge

Dublin-born Colin Fassnidge did his apprenticeship under Raymond Blanc before moving to Australia. He has transformed The Four in Hand Dining Room from a pub eatery into a two-hat "foodie" destination. Named *GQ* Chef of the Year in 2013, his "nose to tail" philosophy turns "undesirable" offcuts into delicious dishes. He is passionate about growing and sourcing ingredients.

> Baross Valley winemakers reckon they have a maximum 25 years left of Barossa Shiraz as we know it.

Grapes

David Bruer, Langhorne Creek, SA

I'd always been interested in farming, but the winemaking came about because of a job. I'm a chemist by training but when I graduated there was a recession and I couldn't get work. I decided to get some teaching qualifications and ended up at an agricultural college teaching young winemakers chemistry. I gradually got more involved in the wine industry; one thing led to another and my wife and I built a winery.

We bought the original 40 hectare property in Langhorne Creek in 1972, which is where the Temple Bruer winery is. We've got three vineyards now. There's 26 hectares on a second property at Eden Valley and eight hectares on a third property at Loxton.

We grow mainly reds, particularly Cabernets, Merlots and Shiraz. We market all over the world, with 70 per cent sold domestically at liquor stores. Our wines are all certified organic and vegan-friendly. Since 2011, we've been carbon-neutral. We intend to get to carbon-neutral in our own right - without buying carbon credits - by 2018.

We are absolutely on the coalface of climate change. Extreme weather events are getting more frequent and they're getting more severe. Hot days are getting hotter and cold days are getting colder. In January 2013 we had a maximum over 49 degrees. The year before we had our first frost for the year on April 5. It killed half a dozen vines of Fronti. I was so peeved about it, because we'd done work to train them. They were just bowled over.

Although one-day events really belt us around, what's more insidious is gradual warmth shifting our vintage forward, from autumn into the summer. Vintage is advancing by almost a day every year Australia-wide. It makes it much harder to pick grapes at their best; the ripening peak gets much sharper.

Barossa Valley winemakers reckon they have a maximum 25 years left of Barossa Shiraz as we know it. Don't you think we ought to bloody well do something about this?

We've pulled out some varieties which are obviously knackered. We pulled out Riesling two years ago. What can we do? We're very much between a rock and a hard place.

We've planted some heat-resistant varieties, one called Montepulciano and another called Saperavi, but we've got marketing problems in converting people from the taste of Shiraz to Montepulciano. How do we deal with that?

Should we address global warming? We have no bloody future if we don't. I worry very much about my children. I just wonder what their future is.

Peach Melba

This classic dessert was created by French chef Auguste Escoffier in 1892 at The Savoy Hotel, London, to honour Australian soprano Nellie Melba. I have stayed true to the origins of this amazing dish while making it my own. The flavours of peaches and raspberries together are so fresh and personify summer. Dollop some thickened cream or ice-cream on top for a truly decadent dessert.

Serves 4
Prep time 45 minutes

Ingredients

- 4 white peaches, ripe
- 1 litre water
- 500 g sugar
- 1 lemon, juice and zest
- 200 ml white wine
- 1 cinnamon quill

Raspberry sauce

- 500 g raspberries
- 150 g sugar
- 1 lemon, juiced

sugar crisp

- 1 sheet puff pastry
- 100 g caster sugar

Method

Use a pot just large enough to hold the peaches, as the poaching liquid needs to cover the fruit. Otherwise, you may need to double the liquid's ingredients.

Place all poaching ingredients, except the peaches, in pot and stir, making sure the sugar has almost dissolved. Put in the peaches, ensuring the liquid just covers them; they will not cook where exposed.

Place a weight, such as a plate, on the peaches to keep them under the liquid. On a medium heat, gently bring to a simmer. Don't boil because the peaches will overcook. Once the liquid is about to simmer, take the pot off heat and allow to cool. Once cool, the skin should slip off.

For the raspberry sauce, place raspberries and sugar in a pot and bring to boil. Once they boil, allow to cool before blending.

Blend the raspberry mix for 1 minute with a stick blender then add lemon juice to balance the sweetness of the raspberries and sugar. Pass the mix through a fine sieve, removing the small seeds from the sauce. Place the raspberry sauce in the fridge. It is ready to use once cool.

For the sugar crisp, take 1 sheet of puff pastry and roll tightly and cut into 1 cm discs. With a rolling pin, roll discs to triple their original size, using the caster sugar like flour to stop the pastry sticking to the bench.

Place discs on greaseproof paper and into a hot oven at 180°C. After 10 minutes the sugar will start to caramelise. When it is golden brown take pastry out of the oven. Place between 2 sheets of greaseproof paper and flatten with a pot or pan. Allow pastry to cool and become crunchy.

To assemble, place peach on a plate and pour 50 ml of raspberry sauce over it. Next to the peach, place a scoop of your favourite ice-cream. Place the sugar crisp between the peach and ice-cream and finish off with some chopped mint.

Ashley Hughes

Ashley is chef de cuisine at Sydney Tower Dining, overseeing 360 Bar and Dining, Sydney Tower Buffet and dedicated event space STUDIO. Part of the Trippas White Group, Ashley is also head chef for the company's tourism operations, namely a full-service venue at Echo Point in the Blue Mountains.

Peaches and global warming

Peaches are a perennial crop grown across southern Australia. In winter, peach trees enter a dormant phase, protecting the tree from cold weather damage. Once dormant, enough exposure to winter chill is needed before regrowth starts again. Without enough winter chill by spring, flowering is disrupted, leading to lower yields of fruit. Climate change effects on peach growing will differ greatly among regions. Minimal impacts are anticipated for Tasmania, for example, while the south-west of Western Australia is expected to experience notable declines in cold weather. Hormonal and other treatments can be used to partly compensate production losses.

Poached Satsuma plums, chocolate sponge and plum cream

Blood plums are a particular favourite of mine; they have an excellent colour that perfectly matches their rich, dark plummy flavour. Satsuma is a Japanese variety with a bitter skin that is perfect in this dessert as it cuts through the rich sweetness of the flesh and the wonderfully pink cream.

Serves 12
Prep time 1 hour

Ingredients

Poached plums

- 12 ripe tegan blue or satsuma plums
- 400 ml prosecco, or similar
- 600 ml water
- 400 g caster sugar
- 1 sprig rosemary
- 2 bay leaves
- 1 tsp black peppercorns
- 2 strips of lemon peel

Sponge

- 170 g chocolate (53%), cut into small pieces
- 6 eggs, yolks and whites separated
- 100 g caster sugar

To serve

- 200 ml pouring cream
- cocoa powder for dusting

Method

To poach the plums, place liquids and sugar in a large shallow saucepan and bring to boil. Feel free to use any alcohol that is white, sweet and not too heavy. Add the other ingredients reduce to a simmer. Leave a few minutes to mingle then lower in plums. Cover plums with baking paper and a little weight on top to ensure they are submerged. Simmer for 15 minutes or until soft and just starting to fall apart.

Gently remove plums and strain off half the liquid to a small pot, pouring the rest back over the plums (with the spices also). Note: The plums and liquor are best served at room temperature and can be prepared up to a week in advance.

Put the strained liquor on the heat and reduce by two-thirds. The sauce should be thick, dark and syrupy. Allow to cool, then whisk in a mixing bowl with cream until you get soft peaks and the cream is pink and fluffy.

To make the sponge, place the chocolate in a heatproof bowl and slowly melt over a double boiler. Whisk the egg yolks with 50 g of sugar in a mixer for about 5 minutes, until it is light, fluffy and forming thick ribbons.

With the mixer on medium speed, slowly scrape in the chocolate until fully combined. Transfer to a mixing bowl. Whisk the egg whites to soft peaks, add remaining sugar and continue whisking until peaks are stiff.

Gradually fold the whites into the chocolate mixture until combined. Spread the mixture into a lined 28 x 36 cm tin and place in an oven heated to 190˚C. Bake for 10-15 minutes. Use a skewer to test if ready. Set aside and leave to cool in tin.

To assemble, gently remove seeds from the plums. Don't worry if they break up a little. Cut the sponge into 24 square pieces. Lay a square of sponge on plate. Add a dollop of cream and 1 plum on top. Use a little juice too. The cream and plums may not stay balanced and may seep – this is part of the appeal. Dust the second sponge square with cocoa powder and place on top. Serve with any remaining cream and plums on the side.

O Tama Carey

O Tama began her cooking career quite accidently in a kitchen in London. At various times she has found herself cooking classic French, Japanese, Chinese, Italian and Sri Lankan cuisines. With these wonderful flavours O Tama anchors her passion with a focus on ingredients, sourcing sustainable produce and working with the season's offerings.

Plums and global warming

Plums are a perennial crop and ripen over spring and summer. Historical observations in Tasmania show plums are ripening earlier in the season. This trend is related to both warmer temperatures and drier conditions. If these trends continue, we may see various types of fruits ripen about the same time. This would compress the window of time for harvesting, requiring either more fruit pickers for a shorter period or, since securing such casual labour can be difficult, picking fruit too early or too late, reducing plum quality and value.

> It's important to protect our environment and our farmland so that it continues to be productive for our children's future.

Passionfruit and strawberries

Tina McPherson, Bundaberg, QLD

We have two farms; our home farm grows strawberries and the other grows passionfruit. The strawberry farm is near Bundaberg; the passionfruit farm is south near Childers.

My husband Bruce and I established the strawberry farm about eight years ago when we came back from farming overseas. We had farmed previously in New Zealand, Uruguay and Indonesia. Our children and their need for a consistent education was a key factor in coming back to Australia. The passionfruit farm we bought later. We've been farming that for about five or six years.

I love working with my husband. We work very well together, better than we do apart. The beauty of our business is that the children can be involved and work and play alongside us. Our business is where our home is. The kids are really an integral part of that.

Neither of us is from this region – it is somewhere we wanted to live. We chose it because it's so fertile and there is good water security. As a consequence, particularly during winter, Bundaberg produces an enormous amount of the country's fruit and veg. Sweet potatoes, tomatoes, eggplants, capsicums, cucumbers, chillies, macadamias, avocados, zucchinis, watermelon – I can pass all that just between home and taking the kids to school. The growing potential of this area is yet to be fully realised.

Bundaberg has had two major floods in the past three years. We were fortunate in that the strawberry farm isn't subject to flooding, but during one of those events we did lose a lot of passionfruit due to waterlogging. Passionfruit vines don't like having wet feet. In this past winter we also lost a considerable number of vines to frosts. It was certainly the worst frost we've had since we've been in the district.

Weather extremes are not such a problem with strawberries; they're an annual crop. However, for the passionfruit it's definitely an issue. They have a two-three year growing cycle. If you lose them, you've got to replant them and you lose out on a year of production. It costs time, effort and money. That's the game we play.

If you're going to adapt, it's very much about the practices you put into place. You're always working to improve your water efficiency and your spray efficiencies, and you want to increase fertiliser efficiencies.

The more efficient our farming systems, the more potential there is to protect them from adverse effects. It's important to protect our environment and our farmland so it continues to be productive for our children's future.

Quince sorbet

Quince is a lovely fruit but less popular than its close relatives pear and apple, because it can't be eaten raw. When cooked for a long time, it changes to a deep red colour with a rich, perfumed flavour. It is very versatile, working well with fatty meats and game, with cheese, added to an apple pie or simply pot-roasted and served with vanilla cream. Its distinct flavour holds up well in a sorbet. I serve this sorbet with a blue cheese panna cotta and wild rocket meringue, but it is also wonderful on its own. A great finish to a classic Sunday roast.

Serves 8-10
Prep time 1 hour 50 minutes plus time to freeze

Ingredients

- 500 g quince, peeled and cored
- 225 g caster sugar
- 1 litre water
- 1 tsp calvados, or brandy
- 1 tsp liquid glucose

Method

Bring everything, except the glucose, to boil and simmer very gently for 90 minutes or until the quince goes deep red in colour.

Allow to cool slightly and puree with glucose.

Pass through a fine sieve and cool in the fridge before freezing in an ice-cream machine. If you don't have an ice-cream machine, freeze mix in ice cubes.

When frozen, puree in a blender until smooth.

Julian Hills

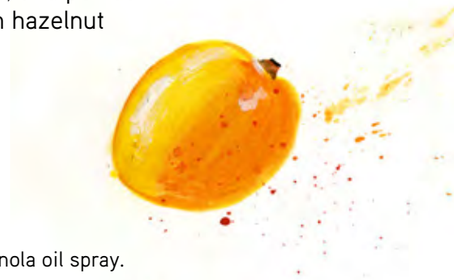
Julian Hills is head chef of the Paringa Estate restaurant on Victoria's Mornington Peninsula. With experience at top restaurants in Australia, the United States and Europe, he creates delicately balanced dishes that complement local wines. Julian sources his produce locally and forages the beaches and hills for wild edibles, which he hopes will continue to flourish and inspire new dishes.

Mangoes and global warming

Mangoes thrive in the heat and are well-suited to the tropical and subtropical areas of the Northern Territory, Queensland, NSW and Western Australia. A warming climate could well increase growth rates, pollen viability and fruit set. However, temperatures above 45˚C will affect fruit development, particularly induction, size and number of flowers. Unpredictable rains during pre-flowering and flowering periods may cause poor fruit set, while any increase in tropical cyclone intensity will damage crops. Climate change could see mango growing move further south. Conversely, traditional growing areas will experience risks of abnormal flowering and fruit set with reduced quality and yield.

Mango and vanilla bean panna cotta

We both enjoy this classic Italian dessert. It is quick and easy to make, and perfect for the summer months, being so light and flavoursome. Serve it with hazelnut praline for a sensuous contrast in textures.



Serves 15
Prep time 20 minutes

Ingredients

- 4 mangoes
- 5 sheets gelatine
- 750 ml cream for whipping
- 25 g caster sugar
- 1 tsp vanilla bean paste

Method

Lightly oil dariole moulds with canola oil spray.

Peel and dice the mangoes, then blitz in a food processer to make a smooth purée.

In a bowl of cool water, place 2 sheets of gelatine for 3 minutes or until soft, then heat in microwave for 30 seconds until melted. Add melted gelatine into food processer and pulse until mixed through.

Divide the mango purée into dariole moulds, filling them half-way. Set aside in the fridge

In a saucepan, put cream and vanilla bean paste on low heat, gently heating to just before boil, and then add the caster sugar. Once dissolved, add the remaining 3 gelatine sheets, using the same process as with the mango purée.

Transfer this mixture into a pouring jug to make it easier to pour slowly on top of the mango in the dariole moulds. Fill the moulds to just below the top. Put in the fridge to set for at least 4 hours

To remove the panna cotta from the dariole moulds, run a small paring knife around the inside before turning out. Serve.

Rebecca and Peter Jacob

Rebecca and Peter Jacob are the chefs and owners behind L'amour De La Femme Restaurant in Bunbury, Western Australia. Their signature is modern Australian and European cuisine with a touch of French technique. They are passionate about quality and proudly use fresh, local produce from the state's south-west.

> “For every one centimetre the sea rises, I need to pump an extra 10 Olympic swimming pools of drainage water off my property.”

Sugar cane

Robert Quirk, Stotts Creek, NSW

I was born into sugar cane farming. Our family has been growing cane for 80 years. My grandfather bought this farm in 1904. He came here from the Isle of Man in 1875, where his family were farmers too.

When I left school we only had 48 acres of cane. Over the years my brother and I developed cane to the whole farm – more than 600 acres. We then split the farm up around 1975. He works his land and I work mine, but we share equipment. Between us we've got a pretty good unit. On my land I've got 262 acres of cane and 25 head of cattle.

I've been green cane harvesting, without the traditional burning, for the past 20 years. As a result the amount of carbon in the soil has gone up and the need to add external nutrients has gone down, chemical use has been reduced and I'm growing more cane.

The NSW sugar industry has three mills; the one I supply, Condong, on the Tweed River, as well as Broadwater on the Richmond and Harwood on the Clarence, are certified to the international Bonsucro sustainability standard. Our products are marketed as Sunshine Sugar. If you buy this sugar, you are guaranteed it has been grown to a global standard.

My favourite thing about being a farmer is the lifestyle. I can work whenever I like, usually about 14 hours a day when I'm home. I've gotten to travel a lot. I've been to 26 countries as a lecturer and speaker on what I've been doing here. If you've got some knowledge, share it, I say. Sometimes it gets a bit busy. I don't spend enough time with my lovely wife.

We grow our best crops when there's no rain or very little rain. We never pray for rain here, because when it starts it doesn't stop. Floods bring aluminium and iron to the surface, which is quite toxic. For two years in a row we had major floods in January, which is when the cane isn't very big. It has caused massive devastation for the farmers here. We can cope with the dry but we can't cope with the wet.

My farm's just half a metre above sea level, so my biggest concern around climate change is rising sea levels. I've done the maths: for every centimetre the sea rises, I need to pump an extra 10 Olympic swimming pools of drainage water off my property.

But I really believe farmers can be part of the solution. Just on my property we've accumulated 37,000 tonnes of carbon over the past 20 years. Conservation farming is what it's all about.

Raspberries and global warming

Raspberries are a deciduous temperate fruit crop requiring substantial winter chilling, relatively cool summer temperatures (below 30˚C) and a rain-free harvest period. Root temperatures should also not exceed 24˚C. Winter chilling of more than 800 hours between 0˚C and about 9˚C is needed to give uniform bud break and flowering in spring. Climate change could lead to insufficient chilling in many regions, resulting in uneven budbreak and erratic flowering. This would make the crop more susceptible to damage from extreme temperatures in summer, when it is ripening, reducing berry production and quality.

Lemon myrtle semifreddo with candied rose petals

When the sun beats down on the black soil plains and the temperature creeps over 40 degrees, this is what you want to eat for dessert in Moree. You can make this and keep it in the freezer for several weeks, ready for when you have people over. The semifreddo looks sophisticated yet is so easy to make and does not require an ice-cream churn. The lemon myrtle – a native Australian herb – imparts the most delicate creamy lemon and lime taste. It is a joy to make, to look at, and to eat.

Serves 8
Prep time 20 minutes plus overnight to freeze

Ingredients

Semifreddo

- 480 ml of cream
- 8 egg yolks
- 250 g sugar
- 120 ml of water
- 5 lemon myrtle leaves, torn into pieces
- 1 lemon, zest and juice

Candied rose petals

- petals
- egg white
- sugar

To serve

- raspberries and blueberries

Method

First lightly whip the cream and put aside in the fridge. With an electric mixer, whip the egg yolks until pale, light and creamy. Leave in the bowl while you turn your attention to making the syrup. Put the sugar, water and torn lemon myrtle leaves into a saucepan. Bring to the boil and let simmer for about 3 minutes. Strain into a small jug, removing the leaves.

Go back to the egg yolks and, with the beaters whipping away, slowly pour in the strained, hot syrup and keep beating until the mixture is cool, for at least 3 minutes. It will actually look less like egg yolks and more like a very gooey, pale meringue mixture. Fold in the whipped cream, lemon zest and juice.

Pour into a mould (such as a mini-loaf tin) lined with cling wrap. Cover with cling wrap and place in the freezer overnight. Make sure you put it in the coldest part of the freezer: the faster it freezes, the creamier it will be.

To candy the rose petals, gather some petals, remove the white bit at the pointy end, as it is bitter, and paint both sides with egg white. Then dip in sugar, covering the entire petal with granules and leave to dry for a few hours on a rack.

To serve, remove the top layer of cling wrap, place a platter over the top and, holding the tin and the platter together tightly, flip. Ease out of the tin, remove the rest of the cling wrap and scatter the candied petals over the top before slicing individual serves. Serve with a side of raspberries and blueberries.

Toby Osmond and Annabelle Hickson

Toby and Annabelle share a love of food and the country around Moree, in northern NSW. A veteran of Sydney's hospitality scene, Toby runs the Yaama Ganu Gallery and Café Gali. Annabelle, a former journalist for *The Australian*, celebrates the pleasures of food in a country town in her blog, The Dailys. Together they run Fork and Spade Catering, offering food and flowers for regional events.

Oranges and global warming

"Citrus greening disease" poses a significant threat to orange production because it can cause trees to die or render fruit unfit for sale. While Australia is currently free of the insect (the Asian citrus psyllid *Diaphorina citri*) that carries the bacterium causing the disease, the bug's potential entry into Australia is of great concern. Hotter temperatures will advance the timing but shrink the window of new leaf growth the insect needs to reproduce. As a result, by 2070 southern areas of Australia previously too cold will become suitable habitat, while potential habitat will reduce across northern Australia.

Macadamia, orange and chocolate crepe cake

Growing up in Queensland, my holidays were spent buying boxes of citrus from stalls on the side of the highway, cracking macadamia nuts off the tree in the backyard and making crepes for a Sunday treat. Add my unrelenting love of chocolate and this recipe is a grown-up mix of my favourite childhood food memories.

Serves 8-10
Prep time 45 minutes
plus 1-2 hours chilling time

Ingredients

Crepes

- 220 g plain flour
- 40 g good-quality cocoa powder
- 2 tbsp caster sugar
- 600 ml milk
- 5 eggs
- 50 g butter, melted and cooled, plus extra for brushing

Macadamia and caramel crumble

- 200 g raw macadamia nuts
- 100 g caster sugar
- 1 pinch salt

Orange sauce

- 5 oranges
- 50 g caster sugar
- 1 vanilla bean, seeds scraped

Chocolate sauce

- 300 g dark chocolate (60–70%)
- 400 ml pure pouring cream
- 300 g fresh ricotta

Method

Place flour, cocoa powder and sugar into a mixing bowl and whisk to combine. In a separate bowl, whisk milk and eggs, then slowly whisk the wet ingredients into the dry, adding milk bit by bit to avoid lumps. Stir through melted butter and set aside for 1–2 hours.

While mixture is resting, pre-heat oven to 180°C (or 160°C fan-forced). Roast macadamia nuts for 8-9 minutes. Set aside to cool and toss with salt. Place caster sugar in a small pot with 30 ml water and bring to the boil. If sugar crystals start to gather, clean sides of bowl with a pastry brush. Cook sugar to a golden caramel colour. Be careful, because as the caramel changes colour it will burn quickly. Once golden brown, quickly pour over the nuts and set aside. When cool, break into rough chunks and chop in a food processor until you have a chunky crumble.

For the orange sauce, grate the zest of 2 oranges and set aside. Peel and cut 3 oranges into segments. Squeeze remaining 2 oranges and reserve juice. Place juice, caster sugar, vanilla seeds and pod into a small pot. Bring to boil and reduce by half, simmering for 4-5 minutes. Remove vanilla bean. Add orange segments and stir gently. Set aside to cool.

In a small pot, bring cream to the boil. Chop chocolate roughly and set aside in a mixing bowl. When the cream is bubbling gently, pour over the chocolate, leave to warm for 2 minutes and stir to combine. Set chocolate sauce aside.

To cook the crepes, heat a shallow fry-pan over medium-high heat and brush with butter. Add about 60 ml of batter. Tilt pan to spread evenly. Cook until the crepe starts to bubble and edges are golden, flip over and cook for a further minute. Transfer to a plate lined with baking paper, separating each crepe with baking paper.

To assemble, spread 3 tablespoons of chocolate sauce across first crepe and sprinkle with crumble. Cover with next crepe and spread 3 tablespoons of ricotta and spoonful of orange sauce. Continue with alternating layers.

Serve immediately, spooning 3 tablespoons of chocolate sauce and the orange segments on top of the cake with any remaining caramel.

Julia Taylor

Julia was runner-up on *MasterChef Australia* in 2012 and the first finalist to complete a pastry apprenticeship. A scholarship student at Sydney's prestigious Le Cordon Bleu culinary academy, Julia worked at Zumbo Patisserie, completing her apprenticeship under acclaimed pastry chef Jean-Michel Raynaud at La Renaissance Patisserie.


TABLE TALK

Dry interior

This region covers most of inland Australia, with an arid climate, high summer temperatures but much lower winter temperatures, low rainfall and high evaporation. It has a highly variable climate with some very wet years leading to large-scale flooding, such as in 2010-11 and 1974-75. Temperatures in the region have increased significantly over the past 100 years, by about 1°C, with most of this warming since 1950, but there has been no long-term trend in rainfall. Continued substantial warming is expected over the rest of this century, from 0.5°C to 1.6°C by 2030 (compared with the 1980-1999 average temperature) and up to 5°C or more by 2070 with ongoing high emissions of greenhouse gases. This warming will be associated with more frequent heat waves and hotter hot days throughout the year, and less frequent frosts in winter. Changes in average rainfall are uncertain, with possible increases in the intensity of the infrequent heavy rain events. Changes in water availability in this region mainly depend on rainfall changes, so they are uncertain. It will continue to be dry, and even hotter than now, with occasional very wet years.

Annabelle Coppin
Cattle, Pilbara, WA

The variable Pilbara climate dictates everything we do. I'm the fifth generation here, and we've got weather records from all the way through to show that. Cattle suit this semi-arid, very variable environment and there's less risk than higher value crops. The climate is the heart of our business model. Everything else revolves around it, especially adequate rainfall. We'll have to focus on adapting to climate change and strengthening our management systems to keep producing on this delicate rangeland environment. We need to look at flexible business models to remain robust while providing a high-quality product and improving the environment.

Graham Finlayson
Cattle, Brewarrina, NSW

We've owned our property for just over 20 years. Over that time the rainfall has seemed to become more erratic and variable. We've had some of the wettest consecutive summers that the old-timers can remember, bookended by two of the worst droughts in the past 100 years. "Reliably unreliable" is how I now think about our climate. We've changed management endeavours to deal with it. Farmers are on the front line of climate change. Unless agriculture becomes more regenerative and less fossil-fuel dependent, and the world changes its energy sources, nothing else we do will be effective in the long term.

Kim Chalmers
Wine grapes, Mildura, VIC

In Mildura we have a desert climate. The evenings are usually much cooler than the days. That's important in grape growing as warm nights affect grape quality; cool nights give them a chance to hydrate and refresh. We have noticed a lot more heat waves, and when you get a heat spell with really hot nights that can impact the crop. Heat waves can also mean sunburn or direct radiant heat damaging the berries. You then need to consider the kind of canopy you grow; you need lots of leaves to shade and protect the bunches from the sun.

Tropical warm-season and sub-tropical moist

The coastal areas of eastern Australia, from north Queensland to the south coast of NSW, experience warm to hot summers and somewhat cooler winters, with heavy rainfall in the warm season. To the north, occasional warm-season tropical cyclones bring extreme rainfall and damaging winds and storm surges. Temperatures have increased significantly over the past 100 years, by about 1°C, but there is no clear long-term trend in rainfall due to large decadal variations.

Continued substantial warming is expected over the rest of this century, from 0.6°C to 1.3°C by 2030 (compared with the 1980-1999 average) and up to 4°C by 2070 with ongoing high greenhouse-gas emissions. A substantial increase in the number and intensity of heat waves and hot days and nights is expected. There will continue to be large variations in rainfall from year to year but long-term changes are uncertain. However, the intensity of heavy rain events is expected to increase, particularly in the warm season.

Warren Waddell
Persimmons, Galston, NSW

My grandfather's orchard grew stone fruit. As a summer fruit, they're prone to environmental and pest-related hazards prevalent at that time of year – sunburn, fruit flies, birds and fruit bats. We converted to persimmons as they're an autumn fruit and initially summer hazards were of no concern. But now we're seeing warmer conditions and an extension of seasonal hazards. We now have to provide the persimmon orchard with the same protection we originally provided the stone fruit. We do fruit-fly eradication well into winter; rising temperatures have extended breeding times for this pest. Climate change is definitely an issue.

Greg Dennis
Dairy, Beaudesert, QLD

There's definitely been a trend towards increased temperatures. In the last year we've seen higher temperatures than have ever been recorded on our property. In January 2014 we hit 45°C, which we've never seen before. Last November was the hottest on record. We have to offer the cows comfort and lower their core body temperature with sprinklers in the dairy. We have shade structures to protect them from the sun. I'm committed to finding a way to make the cows comfortable so we can keep producing milk here. We have four million people to feed in south-east Queensland.

Gavin Scurr
Pineapples, Wamuran, QLD

The Sunshine Coast hinterland is a really special place to me; my family has been farming here for more than 50 years. Our region's elevation, warm frost-free winters and sandy soils are all beneficial for growing pineapples. We get enough rain for the crop without needing to irrigate, even in prolonged dry spells. Farming responsibly according to a region's environmental conditions is important, especially with climate-change predictions for hotter days and more heavy rainfall events. We all want farmers in this region to continue to provide food to Australia and the world for generations to come.

Ben Martin
Mangoes, Bowen, QLD

We have cycles up here of drought and flood. 2008 was the last big flood we had up here. We're a few hundred metres away from the Don River so when a flood comes through we can get up to two metres of water across the land. Climate change is something that we can't ignore. I've taken the farm over from my parents and I'd like to think that in another 30 years my son will take the farm over from me. You need to be looking to the future. I don't want to lose this way of life.

Tropical warm-season wet and tropical wet

The far north of Australia is warm to hot throughout the year, with a pronounced wet season from about November to April. The wet season brings heavy rainfall and infrequent tropical cyclones with extreme rainfall and damaging winds and storm surges. Temperatures don't vary much from day to day, but are a little lower in the winter season. Temperatures have increased over the past 100 years by about 1°C, with greater warming at night. There are large variations of rainfall from year to year, with a small increase since about 1960, particularly in northern Western Australia.

Continued substantial warming is expected over the rest of this century, from 0.5°C to 1.2°C by 2030 (compared with the 1980-1999 average) and up to 4°C by 2070 with ongoing high greenhouse-gas emissions. A substantial increase in the number of heat waves and hot days and nights is expected. There will continue to be large variations in rainfall from year to year but long-term changes are uncertain. The intensity of heavy rain events is expected to increase. Tropical cyclones are expected to decrease in frequency but increase in intensity.

Liz Hirst
Tropical Fruit, Wildwood,
Cape Tribulation, QLD

2010 was the wettest year we've had in years. We get on average four metres of rain annually; it was closer to eight metres that year. The impact on the crops was huge. Conversely, 2014 was one of the driest seasons we've had. Normally rain starts around November; it still hadn't arrived in late December. The land was completely dry and the stressed conditions caused some fruit to flower when it wouldn't normally. We've had to plant so many different species, as you never know what you're going to get. Seeing these extreme patterns is quite concerning.

Torres Webb
Tropical & Native Fruit,
Torres Strait, QLD

Climate change is affecting our culturally important food crops and useful plants, like the coconut. Coastal erosion and sea-level rise is having a big impact; a lot of trees along the coast are eroding away. We've also seen changes in plant flowering times. We're mitigating the impact by using traditional cultural techniques, like planting food crops to hold soil along the coastline. We use local resources around us for mulching, like seaweed. We're encouraging community and family members to take small practical steps – to do their own planting along their area of land rather than getting overwhelmed by it all.

Mike and Margot Black
Bananas & Watermelons,
Douglas Daly, NT

The Northern Territory is known for its extremes: extremely hot, dry, humid and wet. The climatic conditions in the tropics are intense. As farmers and food producers we are fully aware of climate change and the need to keep it in mind for future generations. If we can't produce crops to feed Australia then we are in quite a bit of trouble, aren't we? We maintain the quality of our soils. We aim to produce more vine for watermelons and more canopy for bananas to protect the fruit from the intense heat. We use shade covers and sheds to protect the fruit.

Temperate sub-humid and sub-tropical sub-humid

This region across NSW and inland southern Queensland has warm to hot summers and cool to cold winters, with moderate rain throughout the year. Rainfall can vary greatly year to year, from droughts to flooding. Temperatures have risen over the past 100 years by about 0.8˚C, with most warming since 1950. There has been no clear long-term rainfall trend, with large decadal variations, but a tendency for less rain in the cool season and more in the warm. Continued substantial warming is expected over the rest of this century, from 0.6˚C to 1.2˚C by 2030 (compared with the 1980-1999 average) and up to 4˚C or more by 2070 with ongoing high greenhouse-gas emissions. More hot days and nights, and fewer winter frosts, are expected, with a substantial increase in the number and intensity of heat waves and bush fires. Rainfall will continue to vary greatly from year to year, though long-term annual changes are uncertain. Rainfall is expected to continue to decline in the cool season but possibly increase in the warm season. The intensity of heavy rain events is expected to increase, particularly in the warm season.

Colin Seis
Wool & Grain, Gulgong NSW

I've been here all my life; my great-grandfather settled here in the 1860s. I've certainly seen a shift in this area's rainfall patterns towards more summer rain and less winter rain. That's happened over the last 20 years and has started to become consistent. It's not that total rainfall has changed so much; it's just increasingly variable. Farmers need to have a serious look at how we do things. We need to put in place agricultural practices that are less risky. We need to understand climate change, factor in ecology and work more closely with nature.

Glenn Morris
Beef, Inverell & Grafton NSW

During an extremely hot and dry period in 2002, I was on the front line of a catastrophic fire. I realised just how powerless we are against such extreme conditions. Global warming is reducing the productive capacity of our land, and we're now reducing stock numbers to avoid further damage. Perhaps even more insidious and cruel are the ever-increasing dry spells. In Inverell we have not had decent, soaking rainfall since 2011. All our dams and a once permanent creek are currently dry. Many people in the district are facing their third year in a row without adequate stock feed and water.

Warwick Pickette
Sheep & Cattle,
Coonabarabran NSW

I've seen within my lifetime the temperature increasing and the frosts starting later. Once upon a time, our first frosts would be in mid-April. Now we sometimes don't get them until June. The increase in temperature means the evaporation is so different now; it's much harder to grow the longer season pasture plants. It affects how we feed our stock. We're a summer rainfall zone here. Roughly every second year we'd get the edge of a cyclone and we'd get our dams filled. For about 15 years that just hasn't happened. We used to always have water.

Temperate cool-season wet and cold wet

This region across much of southern NSW, Victoria and Tasmania experiences a cold winter and warm to hot summer, with rainfall throughout the year but more in the cool seasons. It has pronounced year-to-year variability of rainfall ranging from droughts to very wet years. Temperatures have increased significantly since 1950, by about 1˚C. There has been no clear long-term trend in rainfall, with large decadal variations.
Continued substantial warming is expected over the rest of this century, from 0.6˚C to 1.3˚C by 2030 (compared with the 1980-1999 average) and up to 4˚C by 2070 with ongoing high greenhouse-gas emissions. A warming climate will be associated with more hot days and nights, including more summer heat waves, and fewer cold days and nights, including fewer winter frosts. The number of days hotter than 35˚C is expected to increase by about 20 per cent by 2030 and possibly more than double by 2070. Rainfall is expected to decline in the cool season although the magnitude is uncertain, with no clear change in summer rainfall. The reduced rainfall and higher temperatures are expected to lead to more frequent and intense droughts and bush fires, and greater stress on water resources.

Graeme Nicoll
Dairy, South Gippsland, VIC

We're having longer autumns and milder, drier winters. In summer there are more frequent, extended heat waves and intense storm events. It's changed when we can grow grass. That creates issues around when we feed and how we manage our cows. To reflect this change in growing season and manage increased variability, we've altered when we calve our cows. We would have normally calved in the late winter or early spring; now we're calving in late autumn, moving our whole operating system by three months. That's a huge change for a business of this type. It has taken many years to plan and implement.

Richard Clark
Raspberries & Blackcurrants, Westerway, TAS

Our frost season is no longer very predictable; we haven't been getting quite as cold winters. Last year there was a mild winter and frosts came late in spring. If we have flowers on our raspberries and blackcurrants when a frost comes, it will kill them. They won't become berries and we lose part of our yield. That has happened to us several times. Very hot days have also increased in the past 10 years. Fruit that is sitting on a bush for 10 hours in 40˚C heat will start to cook. We have to irrigate to try and cool the fruit.

Charlie Maslin
Beef & Sheep, Monaro, NSW

The changes we've seen on our farm over the past few decades are mostly related to rainfall. The dry spells seem to last longer and have a much greater impact. Water holes have been drying up; one section of our main stream had no water for five kilometres. Conversely, rainfall seems to be more intense and erratic. Recently we had almost 30 per cent of our total year's rain in just two hours. We have 100 years of records for our farm, and our neighbours have 160 years of records. Neither shows anything like this happening in the past.

Richard Weston
Peonies, Olive Oil, Fruit & Vegetables, Hobart, TAS

We're getting markedly drier winters and it's warmer every year. It's almost as though some of the seasons are muddled. There are fewer frosts and less snowfall. I've tracked the frost closely since we moved here in 1993. Back in the 1990s we recorded on average 35 frosts a year. This year we had only six or seven. Frosts are so important as they really assist in pest control, particularly aphids. You've just got to do what you can to adapt. We're very flexible in what we grow; diversification on all levels of the farm is how we can sustain ourselves.

Mediterranean

The south-west of Western Australia, southern South Australia and western Victoria have cool, wet winters and hot, dry summers. In winter, cold fronts and storms from the Southern Ocean bring cold air and rain. In summer, the storms don't reach the land and hot, dry air moves from inland. The south-west has experienced some of the biggest climate changes in Australia, warming about 1°C over the past 100 years with a substantial decline in winter rainfall since about 1960 being directly linked to climate change. Continued warming is expected over the rest of this century, from 0.6°C to 1.2°C by 2030 (compared with the 1980-1999 average) and up to 4°C by 2070 with ongoing high greenhouse-gas emissions. This will mean fewer cold days and nights, more hot days and nights, fewer winter frosts and more summer heat waves. The number of days above 35°C is expected to increase by about 20 per cent by 2030 and possibly more than double by 2070. Further rainfall decline is expected, particularly in winter, though to what extent is uncertain. More frequent and intense droughts, as well as bush fires, are expected.

Bill Long
Grain & Lamb, Ardrossan, SA

We have just come through the driest spring on record. Over the past decade we've experienced more extreme and longer heat waves. Nearby regions have experienced some extreme frost events. Harvest is starting in our region earlier than ever before. In my lifetime of farming I've never seen such rapid early growth of crops due to the warmer temperatures in April and May. Fortunately we are adapting – doing things such as planting crops earlier. However, I am concerned that in the future we won't be able to keep pace with the predicted changes in temperatures and rainfall for our region.

Ian & Di Haggerty
Grain & Sheep, Wyalkatchem, WA

Climate change has certainly affected our farm. There's been a significant drop-off in effective rainfall during the growing season. Our average annual rainfall has dropped from around 325 to 210 millimetres over the past two decades. We've seen prolonged dry spells of four to six weeks, which reduce the growth of our crops and pastures. To adapt, we're bringing planting times forward and doing everything possible to rebuild soil health and capture and hold as much rainfall in the soil. This way we increase our resilience against drought, build biodiversity and help store carbon in the landscape.

David Cook
Beef, Dandaragan, WA

I've been concerned for at least the past decade that we have a very serious problem on our hands. Our rainfall records go back to 1898. I'm able to compare the rainfall they were getting then to what we're getting now. We've lost virtually a third of our rainfall. We're getting less rainfall overall and shorter rainfall events. We can no longer rely on dams; they don't get enough runoff to fill properly. Our water system has also relied on soaks. Some of these have dried up and we've had to put bores down and use groundwater to water our stock.

Sarah Sammon
Rose Petals, Swan Hill, VIC

Warmer weather has extended our growing period. We used to finish picking around late May. The last couple of years we've actually picked into July, when we normally start pruning. It's completely bizarre to be picking in July; we are having frosts and still have roses producing. You can't do the full winter prune until the roses have lost all their leaves and gone into hibernation. This year we didn't finish pruning until early September. That affects our labour, because we now need to contract pruners full time over an intensive period to get everything pruned before the hot weather.

From one extreme to another

Everyone takes an interest in the weather, but for farmers nothing is more important to their livelihood. Weather guides decisions such to when to plant crops, when to harvest and how to manage livestock. The better farmers can predict weather, the better they can work with it to maximise yield.

Accurate long-term prediction of what the weather will do on any given day is virtually impossible. Climate scientists can, however, make reasonably accurate long-term predictions about how the weather will generally behave on larger time scales. To understand why, meteorologist and Earth Hour ambassador Magdalena Roze says, one has to appreciate the relationship between climate and weather.

"Climate is what you expect, weather is actually what you get," says Magdalena, known to many Australians for presenting the weather on television. "When you average weather out over a number of years, and typically you need about three decades to be able to determine a long-term trend, that's what you call the climate."

Global warming drives both climate change and weather events. The trapping of more solar energy in the atmosphere means higher temperatures that are directly associated with heat waves and bushfires. Hotter temperatures also lead to more evaporation and thus more moisture in the atmosphere, which worsens the intensity of rain and flooding from severe storms and cyclones. Thus the combination of elevated heat and moisture in the atmosphere increases the likelihood, duration, frequency and intensity of extreme weather events of many kinds.

The one type of extreme event not expected to increase in frequency is cyclones, but those that do occur are likely to be more intense, with greater catastrophic potential.

"Heat waves, bushfires and floods are things that have happened in Australia forever and they always will," Magdalena says. "We're just in a scenario now where these things are becoming a lot worse."

With catastrophic weather events increasing risks to farming, consumers can expect to pay more for produce. In the aftermath of Cyclone Yasi, for example, devastation of Queensland's banana crops saw the price of bananas in supermarkets skyrocket to $15 a kilogram.

Magdalena Roze

Planting seeds

When John Ive acquired his farm 35 years ago, many locals regarded it as a lost cause. The land was severely degraded from dryland salinity, soil acidity and erosion. He and his wife Robyn named the property "Talaheni" – Arabic for "wait a while" – in recognition it would take patience to restore the land to health.

The process has become a life-long passion. John recalls the Christmas Robyn gave him the gift he most wanted: a salinity meter: "I got up like a five-year-old boy at 5am on Christmas Day, found my meter, drove out to the farm and went around measuring the salinity of the 38 dams, totally engrossed. I didn't get back to town until 3pm, by which stage my family was out looking for me. I was so chuffed I had all the salinity values, I couldn't understand why they were so put out."

Reducing salinity was the first step in reforming Talaheni. The Ive's farm is in the Yass Valley, where salinity levels have been doubling every decade. Across Australia, losses from dryland salinity cost farmers and the nation hundreds of millions of dollars a year.

John planted more than 250,000 trees to stablise the water table and regenerate the soil, allowing perennial pastures to be resown. The property is now sucking carbon out of the atmosphere, with soil carbon levels increasing fivefold, and the livestock carrying capacity is up tenfold.

However, Ive fears his work to rehabilitate the land will be in vain: "Even if I did everything possible I'm still going to be a lot worse over time because of climate change." He believes farmers have to build public support for broader action to tackle global warming.

He isn't alone. "Farmers don't want to just sit back and be victims of rising temperatures and more extreme weather," says Mark Wootton, a sheep and cattle farmer near Hamilton, Victoria, who helped to found think tank The Climate Institute.

Mark is also passionate about the need for Australia to set a stronger target to cut carbon pollution. "We're standing up for our land and calling for change," he says.

John Ive

Mark Wootton

Food versus fuel

Andrew Pursehouse's farm shares three boundaries with the world's second-largest coal miner. China's Shenhua Group has acquired more than 40 neighbouring properties – 15,000 hectares of farmland – near Breeza on the Liverpool for an open-cut coal mine. "It's the wrong mine, in the wrong place," Andrew says. "You don't go and destroy your prime land and its water resources."

When farmland sits atop coal and gas deposits – the same fossil fuels that contribute to global warming – what should be valued? "Coal might be here for 30 to 50 years," Andrew says. "The agricultural productivity of this land could be here for thousands of years. It's short-term gain for what may well be long-term pain."

Mining or exploration permits cover an estimated 90 per cent of the Liverpool Plains, long valued as farmland for its rich black soil and large alluvial aquifers. It's a similar story for the equally fertile soils further north in Queensland's Darling Downs. The threat of a coal mine there led Felton farmer Rob McCreath to grassroots activism. In 2014 he gained global attention by ploughing "G20 Go Solar" into his paddock – a message aimed at world leaders gathering in Brisbane. "If our governments were acting in the best interests of farmers, they would switch quickly to renewable energy," Rob says. "Climate change matters because the most important thing for farmers is moisture. The hotter it gets the less effective rain is, because moisture evaporates from soil more quickly."

Penny Blatchford, a broad-acre cropper from Gurley, in NSW's Moree plains district, agrees fossil-fuel extraction is counter-productive to farmers' long-term interests. With her crops reliant on artesian water, she feared contamination from coal seam gas extraction, and won a hard-fought campaign against an exploration proposal. "We're known as having clean and green food." Penny says. "Having fossil fuels across our food-producing land compromises the integrity of that image."

Penny Blatchford

Rob McCreath

Andrew Pursehouse

Taking the reins

For fourth-generation farmer Josh Gilbert, it was conversations with his grandfather about changes on their property that convinced him to take climate change seriously, both by improving the adaptive capacity of his own farming practices and by helping others to understand the challenge of conditions unknown to their forebears.

"Young farmers really have pride for how long our parents and previous generations have been farming for, and we want to be able to hand it on to our kids," Josh says. "The greater educational opportunities that young farmers have enjoyed, especially in regard to agricultural and environmental science, also invests us with with greater responsibility to drive the conversation about issues like the impact of climate change."

"Youth have to lead the charge in this area. That's our responsibility. We have to be the ones who are actually sharing what is happening on our farms."

Along with chairing the NSW Young Farmers Council, Josh has been part of the Young Farming Champions program, speaking to schools and community groups about the future of agriculture. Addressing climate is part of that, he says: "Every Australian farmer feeds 600 people – 150 in Australia and 450 overseas, By farming smarter and making people more aware that climate change is happening, we can hopefully face the challenge to feed the world."

Tom Tourle, a sixth-generation wool grower also involved in the Young Farming Champions program, agrees: "What we do now is going to affect us in the long-term. We're in this for the next 50 years. It's about looking at the big picture and holistically what we have to do."

In early 2014, Tom took part in the Young Carbon Farmers' "Carbon Bus" tour of northern Queensland, travelling with climate and agricultural experts to teach farmers how to manage climate variability. "The education we've got available is a big driver," he says. "Young people really want to have a go at this stuff. They're not prepared to wait until they're 30 or 40 to start making changes to their businesses and their environment."

Tom Tourle

Joshua Gilbert

The human factor

Though floods, droughts and bushfires are accepted as part of life in rural Australia, the increased risks associated with climate change will add to the financial and social stress felt by farming families and communities already under pressure from markets, isolation and limited access to services.

Pip Job, 2014 winner of the Rural Industries Research & Development Corporation's National Rural Woman of the Year award, has seen many farmers in her district struggle with the enormous stress caused by drought. Her personal experience is supported by public health research identifying poorer mental health in farming communities living with prolonged drought.

As chief executive of her local Landcare group, Pip has been passionate about taking care of the mental environment along with the natural environment. "People are one of your most important assets as a farmer," she says. "It's no different to figuring out how to maintain, regenerate and enhance soil; it's just as important to ask how we best maintain and enhance the people in the business."

She sees the effects of climate change already causing significant stress among farmers in her community: "We're into our third year without a spring. It's really crippling. People are unsure about how to adapt."

While adequate health care services will be vital for farming communities facing additional stress from climate change, the very conditions that force farmers off the land and impoverish rural towns make those services less accessible. "We're about to lose the psychologist that visits our community," Pip notes. "I have huge concerns about how families and individuals are going to get the help they need when things are critical."

Pip's approach through her Landcare work, and a program she initiated called Positive Farming Footprints, is to help farmers to adapt their farms for the future. She has a strong focus on business acumen and developing farming enterprises to proactively manage climate change. She hopes more public attention is paid to building resilience and confidence in farming families: "If you're in control, or at least have more control, over what you're doing, it's better for your mental health."

Pip Job

Friends in need

Across Australia, millions of unpaid agricultural workers labour all day for not much more than a spoonful of honey. Almost all fruit and vegetable crops rely on the pollination work of nature's farmer, the bee. The value of services that bees, mostly of the wild variety, provide to agricultural production is estimated to be as high as $6 billion a year.

"Bees pollinate the majority of the food that we eat," explains Des Cannon, editor of *The Australasian Beekeeper*, a journal that has been published since 1899. "Almonds, for example, are 100 per cent reliant on bees for pollination. No bees, no nuts. Other crops are similar. Apples and pears are 95 per cent reliant."

A warming climate threatens the ability of bees to successfully do their jobs by both altering plant flowering patterns and changing bee behaviour.

Des cites the example of the Yellow Box and Apple Box eucalypts he uses as "honey crops" on his own property in Urila, NSW. Higher temperatures have shortened and shifted tree flowering times, reducing bees' opportunity to forage for nectar and produce honey.

Extreme heat events have particularly stark effects. When the temperature gets above 37°C and the hive is danger of overheating, bees switch from collecting nectar to water in order to cool the hive. By the time the temperature reaches 43°C, almost the entire colony will be collecting water, at the expense of producing honey to feed themselves. At extremes above 47°C, beeswax can soften to the point that the entire hive collapses.

Beekeepers in Australia have observed such meltdowns during recent summers, Des says. "Extreme heat events and drought have the potential to severely reduce the feral bee population. This has already occurred in places like Batlow, NSW, affecting apple pollination, and Young, NSW, affecting cherry pollination. In both these regions growers now pay commercial beekeepers to use their managed hives to effect pollination."

But the viability of these human-managed services is also under threat, Des warns. "Beekeepers traditionally coped with variable weather patterns by shifting their bees to a better area," he says. "This is no longer as possible."

Des Cannon

Space invaders

More than most in the community, farmers worry about the threat of alien invaders. Introduced pests, disease and weeds – technically known as "invasive alien species" – are estimated by the CSIRO to cause $8 billion a year in damage to Australian stock, feed and crop yields. Invasive species represent the largest biological threat to food security, as well as a large risk to native species.

As climatic conditions shift due to global warming, so too do the conditions conducive to invasive species. The Queensland fruit fly, for example, already costs Australian horticulture $28.5 million a year and is expected to move southward as temperatures increase.

Lucinda Corrigan, who chairs of the Primary Industries Ministerial Advisory Council, has experienced the problem firsthand in the Murray Valley, where she runs a cattle-breeding business with husband Bryan.

In 2010, the microscopic Theileria parasite began to appear in surrounding districts. The tick-borne parasite, which enters the bloodstream of cattle and destroys their red blood cells, causing them to become ill and eventually killing them, was previously only seen in sub-tropical and coastal parts of northern Australia. Now it has become endemic in the Murray-Darling region.

"The issue is that now the ticks can survive over winter and they have done over the last four years," Lucinda says. "We had a neighbour who lost 10 head of cattle. Although we operate very strict biosecurity, we were incredibly worried. It would put us out of business, because we sell breeding stock. The last thing we'd want to do is introduce a new disease into a client's herd."

As well as pests and disease, the effect of climate change on weeds is another major concern for farmers. Where native vegetation is stressed by fire, drought and flooding, weeds gain the opportunity to move in and replace them. This poses issues for livestock feed. Most of Australia's most problematic weeds, like lantana, athel pine and rubber vine, do better in more extreme conditions, which means their invasive power will increase. "Weeds are adapting to a wider range of environments," Lucinda says. "We have little doubt that it is climate-affected."

Lucinda Corrigan

Scientific bodies such as the Intergovernmental Panel on Climate Change, NASA, CSIRO, the Bureau of Meteorology, numerous national academies of science and others have concluded that

CLIMATE CHANGE

is occurring as a result of human activities such as burning fossil fuels like coal, oil and gas.

Heatwaves have become longer and more frequent. Bushfire danger weather has increased. While Australia has always had droughts and floods, all extreme weather events are now being influenced by global warming because they are occurring in a climate system with a hotter, more moist atmosphere than 50 years ago.

The good news is it's not too late to tackle global warming. We have the solutions and technologies that make a more sustainable and prosperous future possible.

Australia's global warming profile

Australia's per capita greenhouse gas emissions are nearly double the average of other developed nations and more than four times the world average.

Production-based CO^2 intensity, tonnes per capita:

17.8 tonnes
Australia

10 tonnes
Developed nations

4.5 tonnes
World average

72 per cent of Australia's emissions come from fossil fuels

Australia is the 15th largest producer of greenhouse gas emissions out of 196 countries

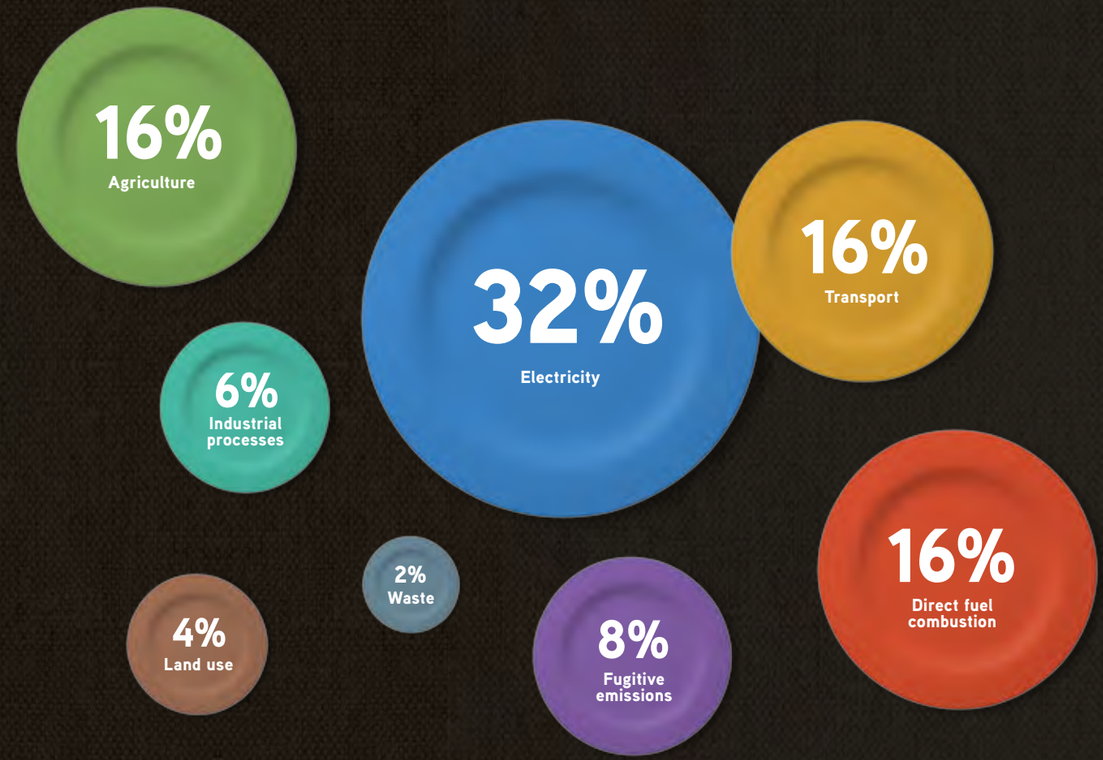
Australia's greenhouse gas emissions come from the following sources:

Electricity 32%
Electricity generation is the largest source of Australia's human-created greenhouse gas emissions. Most emissions come from burning coal and natural gas. Renewable sources of electricity generation such as wind and solar do not emit greenhouse gases.

Transport 16%
Transport emissions derive from the direct combustion of fuels in transportation by road, rail, domestic aviation and shipping. Road transport accounts for about 85 per cent of all transport emissions. Domestic aviation contributes about 8 per cent. International aviation is counted separately.

Direct fuel combustion 16%
Emissions from direct fuel combustion exclude those for electricity generation and transport. They include such things as fuel combustion in petroleum refining, oil and gas extraction and processing, coal mining and solid fuel manufacturing.

Fugitive emissions 8%
Fugitive emissions are those that occur during the production, processing, transport, storage, transmission and distribution of fossil fuels such as black coal, crude oil and natural gas. Emissions from decommissioned underground coal mines are also included.



Agriculture 16%
Emissions from agriculture include methane and nitrous oxide from enteric fermentation in livestock, manure management, rice cultivation, agricultural soils, savanna burning and field burning of agricultural residues. Carbon-dioxide emissions also come from the application of urea and lime.

Industrial processes 6%
Emissions from industrial processes are the result of by-products from materials and reactions used to produce things like chemicals, metals, and minerals, as well as emissions from the use of synthetic gases.

Land use and forests 4%
Under the Kyoto Protocol, deforestation is defined as the direct, human-induced removal of forest cover on land that was forest on 1 January 1990. Emissions result when cleared vegetation is burned or left to decay. Emissions from deforestation are offset by afforestation and reforestation, namely new forest plantations.

Waste 2%
Waste includes emissions from landfill, wastewater treatment, waste incineration and the biological treatment of solid waste. Emissions largely consist of methane, which is generated when organic matter decays under anaerobic conditions.

60+ Sustainable Menu

6 ideas to help you on your sustainability journey

BE A CONSCIOUS CONSUMER

We love healthy, Aussie-grown food that's good for us and the environment - so we need to support the land and farmers that produce it. Look for information that informs you where your food is coming from and whether it is sustainably grown, caught or sourced. Farmers are on the front line of global warming, so support retailers that treat them fairly, or support them in person at your local farmers market. Outside the kitchen, use your consumer power to support ethical and environmentally friendly products.

JOIN THE CONVERSATION

There's no better place to start a conversation than over a meal – ideally a candle-lit one during Earth Hour. Invite family and friends over to enjoy one of the recipes in this cookbook and talk about how to create a better world. Join one of the many local groups and movements working to reduce the carbon pollution that causes climate change. Get involved in Earth Hour Action and WWF-Australia in working with communities, business and governments on solutions.

USE LESS, RECYCLE, REUSE, SHARE

On average, we throw away about 20 per cent of the food we buy: that's about 345 kg per household. Not only does this waste the resources and energy used to produce food, it contributes to greenhouse gas emissions when it ends up in landfill. Think about what you buy, start a compost heap or worm farm, and use your leftovers (google "food wise" for more info). Check out the rise of the sharing economy, where services allow you to use other people's stuff without buying something new (google "collaborative consumption" to find out more).

Since Earth Hour started back in 2007, Australians have come so far in making sustainability a normal part of our lifestyles. Millions of us now recycle, use energy-efficient lighting and a whopping 2 million households now have rooftop solar. But with 2014 officially the hottest year on record globally, there's never been a better time to step up and take it to the next level.

JOIN THE RENEWABLE ENERGY REVOLUTION

Is your household already one of the 2 million Australian homes with solar? There are many easy and affordable ways to switch to solar now, including $0 up-front and solar leasing options. The more households with solar, the faster we move away from dirty fossil fuels like coal and gas. If you can't install solar, compare your energy retailers (google "green electricity guide") to find out which utility is most renewables-friendly, and choose a bank or superannuation fund doing the right thing by excluding investments in fossil-fuel expansion.

USE LESS ENERGY

Did you know that the French aim to have 95 per cent of households with a smart meter by 2016? These simple tools can help you reduce energy use, and therefore your bills, by monitoring your energy consumption. Speak to your energy provider about getting one installed. Most households can easily save up to 20 per cent of current electricity consumption. From big items like unneeded second refrigerators to chargers left plugged in, televisons left on stand-by and overheating halogen downlights, there are so many simple actions to reduce energy waste.

TALK TO YOUR LOCAL POLITICIANS

History shows that change happens only when we demand it. Political leaders didn't just wake up one day and decide to give women the right to vote, or to abolish slavery. So take a few minutes to call or email your local politician, or send them a message on social media. Political leaders only ever aim as high as their constituents demand, so let them know that you care.

Thinking about tomorrow

James Walker, Longreach, QLD

Ultimately we farmers are custodians. If we take too much from the system this year it will affect productivity next year. It's a balance which weighs on us heavily. Now, knowing more about climate change, the impacts amplify the need to do everything we can to continue to produce food for the world.

I got involved with Earth Hour because of this great opportunity to celebrate and support farming. The effects of increasing climate variability can really cripple a farmer's business – environmentally, financially and socially. We have to be equipped to handle more variability. We have to preserve and enhance the resources we look after. If we can't adapt, we can't be sustainable and survive.

On our property we've had to change. We can't have a traditional, repeatable production system. We have to be flexible. Rainfall variability has been very pronounced in recent history. When we get forecasts that indicate we're going into drought conditions, we de-stock and stop production. In the past 15 years, we've have to de-stock three times due to drought or low rainfall.

With the current drought we've been totally de-stocked for two years now, limiting any revenue. We have diversified into tourism. We have buses and self-drive tours where we show visitors what happens on an outback station. They get to see the homestead that Queen Elizabeth also once visited; we show them cattle and sheep, have smoko and drive them through the paddocks. At night we have dinner and sunset drinks with 360-degree views of the country. We cook and eat some of our local organic lamb. People love the hospitality and experience.

We want to show what we do in agriculture, the challenges we face and that it's a true honour to be producing food, looking after country and animals. It's great to see people connect so easily with being out here. They love the space and the character of the people. We just want to share that with them.

Farming is the most important profession to be engaged with; the balance of creating food and fibre is very delicate. Everyone globally should know the value of what farmers do.

In this cookbook you can see the beautiful produce that's possible in Australia. As farmers we want to continue that, if not improve it. It's so important for the community to continue supporting agriculture. That includes taking steps to avoid the worst impacts of climate change. I hope this cookbook can instil confidence that Australian farmers produce food that is as safe and pure as anywhere in the world, and that it is in the best interests of everyone that we take care of the land.

Our farmers

We encourage readers to support Aussie farmers, especially the ones in this book

Derek and Kirrily Blomfield
www.theconsciousfarmer.com.au

Graham Brookman
www.foodforest.com.au

Margot and Mike Black

Penny Blatchford
www.lockthegate.org.au

David Bruer
www.templebruer.com.au

Des & Jenan Cannon
www.theabk.com.au

Kim Chalmers
www.chalmerswine.com.au

Richard Clark
www.lanoma.com.au

David Cook
www.dandaraganorganicbeef.com.au

Annabelle Coppin
www.centralstation.net.au/meet-the-crew/yarrie-station/

Lucinda Corrigan
www.rennylea.com.au

Greg Dennis
www.scenicrim4realmilk.com.au

Graham Finlayson
www.slmpartners.com

Josh Gilbert
www.art4agriculture.com.au

Ian and Di Haggerty
www.soilsforlife.org.au/cs-prospect-pastoral-company

Nathanael Harris

Peter Holding

Liz Hirst
www.capetrib.com.au

John & Robyn Ive
www.target100.com.au/Farmer-stories/John-Robyn-Ive

Pip Job
www.littleriverlandcare.com.au

Steven Lizzio
www.liverpoolriverbananas.com.au

Bill Long
www.agconsulting.com.au

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Ben Martin

Charlie Maslin
www.soilsforlife.org.au/cs-gunningrah

Ewan McAsh
www.mcashoysters.com

Rob McCreath
www.fof.org.au

Mike McFarlane

Rob McGavin
www.boundarybend.com

Ashley McMurtrie
www.soilsforlife.org.au/cs-gilgunnia-station

Tina McPherson
www.tinaberries.com.au

Glenn Morris
www.figtreesorganicfarms.com.au

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www.gippsdairy.com.au

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Breeza Station

Robert Quirk
www.bonsucro.com

John Said
www.freshselect.com.au

Sarah Sammon
www.simplyrosepetals.com.au

Linda Sams
www.tassal.com.au

Scott Samwell
www.nuffield.com.au/scholar-profile-scott-samwell

Gavin Scurr
www.pinata.com.au

Colin Seis
www.winona.net.au/farming.html

Sue and Matt Simmons
www.melandapark.com.au

Lynne Strong
www.cloverhilldairies.com.au

Tom Tourle
www.art4agriculture.com.au

James Walker
www.agrihive.com

Warren Waddell

Torres Webb
www.aycc.org.au/seed

Richard Weston
www.westonfarm.com.au

Mark Wootton
www.jigsawfarms.com.au

Sources

Chapter 1: Cereals, Nuts and Legumes

Almonds (page 14)
Fuentes, Sigifredo, M. Mahadevan, M. Bonada, M. A. Skewes, and J. W. Cox. "Night-time sap flow is parabolically linked to midday water potential for field-grown almond trees." *Irrigation Science* 31, no. 6 (2013): 1265-1276.

Lobell, David B., Christopher B. Field, Kimberly Nicholas Cahill and Celine Bonfils. "Impacts of future climate change on California perennial crop yields: Model projections with climate and crop uncertainties." *Agricultural and Forest Meteorology* 141, no. 2 (2006): 208-218.

Luedeling, Eike, Evan H. Girvetz, Mikhail A. Semenov, and Patrick H. Brown. "Climate change affects winter chill for temperate fruit and nut trees." *PLoS One* 6, no. 5 (2011): e20155.

Wheat (page 16)
Myers, Samuel S., Antonella Zanobetti, Itai Kloog, Peter Huybers, Andrew DB Leakey, Arnold J. Bloom, Eli Carlisle et al. "Increasing CO2 threatens human nutrition." *Nature* 510, no. 7503 (2014): 139-142.

Canola (page 20)
Högy, Petra, Jürgen Franzaring, Klaus Schwadorf, Jörn Breuer, Wolfgang Schütze, and Andreas Fangmeier. "Effects of free-air CO2 enrichment on energy traits and seed quality of oilseed rape." Agriculture, ecosystems & environment 139, no. 1 (2010): 239-244.

Corn (page 22)
Lobell, David B., Michael J. Roberts, Wolfram Schlenker, Noah Braun, Bertis B. Little, Roderick M. Rejesus, and Graeme L. Hammer. "Greater Sensitivity to Drought Accompanies Maize Yield Increase in the US Midwest." *Science* 344, no. 6183 (2014): 516-519.

Chickpeas (page 26)
Clarke, H. J., and K. H. M. Siddique. "Response of chickpea genotypes to low temperature stress during reproductive development." *Field Crops Research* 90, no. 2 (2004): 323-334.

Devasirvatham, V., D. K. Y. Tan, P. M. Gaur, T. N. Raju, and R. M. Trethowan. "High temperature tolerance in chickpea and its implications for plant improvement." *Crop and Pasture Science* 63, no. 5 (2012): 419-428.

Leport, L., N. C. Turner, R. J. French, M. D. Barr, R. Duda, S. L. Davies, D. Tennant, and K. H. M. Siddique. "Physiological responses of chickpea genotypes to terminal drought in a Mediterranean-type environment." *European Journal of Agronomy* 11, no. 3 (1999): 279-291.

Regan, K., MacLeod, B., & Siddique, K.. Production packages for kabuli chickpea in Western Australia. No. 117. Farm Note, 2006.

Rice (page 28)
"Rice and climate change," International Rice Research Institute, (2014), http://irri.org/news/hot-topics/rice-and-climate-change.

Barley (page 34)
Stokes, Chris, and Mark Howden, eds. *Adapting agriculture to climate change: preparing Australian agriculture, forestry and fisheries for the future.* CSIRO Publishing, 2010.

Lentils (page 36)
"Growing Lentil," Department of Environmental and Primary Industries, last modified May 8, 2014, http://www.depi.vic.gov.au/agriculture-and-food/grains-and-other-crops/crop-production/growing-lentil.

Murray G.M. and Brennan J.P. *The current and potential costs from diseases of pulse crops in Australia*. Canberra: Grains Research and Development Corporation, 2012.

Shrestha, R., N. C. Turner, K. H. M. Siddique, D. W. Turner, and J. Speijers. "A water deficit during pod development in lentils reduces flower and pod numbers but not seed size," *Crop and Pasture Science* 57, no. 4 (2006): 427-438.

Walnuts (page 40)
Luedeling, Eike, Evan H. Girvetz, Mikhail A. Semenov, and Patrick H. Brown. "Climate change affects winter chill for temperate fruit and nut trees," *PLoS One* 6, no. 5 (2011): e20155.

Soybeans (page 42)
"Expensive water blamed for Riverina's drop in soybean plantings," Laurissa Smith, ABC Rural, Last modified December 9, 2014, http://www.abc.net.au/news/2014-12-09/riverina-soybean-plantings-decline/5952760

Kucharik, Christopher J., and Shawn P. Serbin. "Impacts of recent climate change on Wisconsin corn and soybean yield trends." *Environmental Research Letters* 3, no. 3 (2008): 034003.

"Soybean research for a growing industry information sheet," Commonwealth Scientific and Industrial Research Organisation, last modified 2012, http://www.csiro.au/Outcomes/Food-and-Agriculture/soybean.aspx

Chapter 2: Vegetables

Kale (page 46)
"Colewort and Kale," Deirdre Larkin, The Metropolitan Museum of Art, last modified October 22, 2010, http://blog.metmuseum.org/cloistersgardens/2010/10/22/colewort-and-kale/

Deuter, P. "Defining the impacts of climate change on horticulture in Australia," *Garnaut Climate Change Review, Horticulture Australia Ltd* (2008): 1-23.

Cabbage (page 48)
Deuter, P. "Defining the impacts of climate change on horticulture in Australia," *Garnaut Climate Change Review, Horticulture Australia Ltd* (2008): 1-23.

Cucumber (page 52)
Deuter, P. "Defining the impacts of climate change on horticulture in Australia," *Garnaut Climate Change Review, Horticulture Australia Ltd* (2008): 1-23.

Reddy, K. Raja, and H. F. Hodges, eds. *Climate change and global crop productivity*. CABI, 2000.

Avocados (page 58)
Howden, M, S. Newett, and P. Deuter. "Climate Change - Risks and Opportunities for the Avocado Industry," *Australian & New Zealand Avocado Growers' Conference* (2005): 1-19, http://www.avocadosource.com/Journals/AUSNZ/AUSNZ_2005/HowdenMark2005.pdf

Potatoes (page 60)
Sparks, Adam H., Gregory A. Forbes, Robert J. Hijmans, and Karen A. Garrett. "Climate change may have limited effect on global risk of potato late blight," *Global Change Biology* 20, no.12 (2014): 3621-3631.

Sweet potato (page 64)
"Pacific Food Security toolkit - Building Resilience to Climate Change: Root Crop and Fishery Production," Food and Agriculture Organization of the United Nations, (2010), http://www.fao.org/docrep/014/i1950e/i1950e00.pdf

Carrots (page 66)
Department of Agriculture, "Australian food statistics 2012–13," (2014), accessed online 6/1/15, http://www.agriculture.gov.au/SiteCollectionDocuments/ag-food/publications/food-stats/australian-food-statistics-2012-13.pdf

"Impacts by crop: Carrots," Gordon Rogers, Applied Horticulture Research, Impacts of climate on the Australian Vegetable Industry, (2013), accessed 16/12/14, http://www.vegetableclimate.com/crop-impacts/carrots/

Pitt, T., A. Ostie, D. Alcoe, and G. Green. "DEWNR Technical Note 2013/09: Climate change in the Northern Adelaide plains and implications for horticulture," Department of Environment, Water and Natural Resources, Government of South Australia, 2013.

Zucchini (page 70)
"Zucchini Marrows," Department of Environment and Primary Industries, State Government of Victoria, last modified September, 2013, http://www.depi.vic.gov.au/agriculture-and-food/horticulture/vegetables/vegetables-a-z/growing-zucchini-marrows

Onion (page 76)
"About Onions," Onions Australia, 2010, Accessed 20/1/15, http://www.onionsaustralia.org.au/aboutonions/about-the-industry.htm

Deuter, Peter, "Defining the impacts of climate change on horticulture in Australia", *Garnaut Climate Change Review*. Cambridge, 2008.

Chapter 3: Meat and Dairy

Beef (page 74)
Cullen, B.R., I.R. Johnson, R.J. Eckard, G.M. Lodge, R.G. Walker, R.P. Rawnsley, and M.R. McCaskill. "Climate change effects on pasture systems in south-eastern Australia," *Crop & Pasture Science* 60, (2009): 933–942.

Henry, B., E. Charmley, R. Eckard, J.B. Gaughan, and R. Hegarty. "Livestock production in a changing climate: adaptation and mitigation research in Australia." *Crop and Pasture Science* 63, (2012): 191-202.

O'Connor, S.F., J.D. Tatum, D.M. Wulf, R.D. Green, and G.C. Smith. "Genetic effects on beef tenderness in Bos indicus composite and Bos taurus cattle." *Journal of Animal Science* 75, (1997): 1822-1830.

Chicken (page 80)
Charles, D.R. "Responses to the thermal environment," in *Poultry Environment Problems: a guide to solutions*, eds. D.A. Charles A.W. Walker, pp.1-16. Nottingham, United Kingdom: Nottingham University Press, 2002.

Olives (page 82)
Thorburn, Peter, Elizabeth Meier, Mark Howden, Brenda Cullen, and Snow Barlow. *New rural industries for future climates*. Rural Industries Research and Development Corporation, 2010.

Capsicum (page 84)
Burt, J. "Growing capsicums and chillies," Farmnote 64/99. Perth: Western Australia Department of Agriculture and Food, 2005.

"Impacts by crop: Capsicums", Gordon Rogers, Applied Horticulture Research, Impacts of climate on the Australian Vegetable Industry, 2013, accessed 12/01/15, http://www.vegetableclimate.com/crop-impacts/capsicums/

Murison, J. "Capsicums and chillies", in *Horticulture Australia*, ed. B. Coombes, Victoria, Australia: Morescope Publishing, 1995.

Webb, L., and P.H. Whetton. "Horticulture," in *Adapting Australian Agriculture to Climate Change*, eds. Stokes, C., & Howden, M., 119-136. Collingwood: CSIRO Publishing, 2010.

Lamb (page 90)
Cullen, B.R., I.R. Johnson, R.J. Eckard, G.M. Lodge, R.G. Walker, R.P. Rawnsley, and M.R. McCaskill. "Climate change effects on pasture systems in south-eastern Australia," *Crop & Pasture Science* 60, (2009): 933–942.

Revell, D.K., H.C. Norman, P.E. Vercoe, N. Phillips, A. Toovey, S. Bickell, E. Hulm, S. Hughes, and J. Emms. "Australian perennial shrub species add value to the feed base of grazing livestock in low- to medium-rainfall zones," *Animal Production Science* 53, (2013): 1221-1230.

Wine grapes (page 92)
Bonada, M., V. Sadras, M. Moran, and S. Fuentes. "Elevated temperature and water stress advance shrivelling, mesocarp cell death and sensory traits in Shiraz berries," *Australian Journal of Grape and Wine Research* 31, no. 6 (2013): 1317-1331.

Fuentes, Sigfredo, Wendy Sullivan, Joanne Tilbrook, and S. Tyerman. "A novel analysis of grapevine berry tissue demonstrates a variety-dependent correlation between tissue vitality and berry shrivel," *Australian Journal of Grape and Wine Research* 16, no. 2 (2010): 327-336.

Hannah, Lee, Patrick R. Roehrdanz, Makihiko Ikegami, Anderson V. Shepard, M. Rebecca Shaw, Gary Tabor, Lu Zhi, Pablo A. Marquet, and Robert J. Hijmans. "Climate change, wine, and conservation," *Proceedings of the National Academy of Sciences* 110, no.17 (2013): 6907-6912.

Tyerman S.D., S. Fuentes, C. Collins, and S. Bastian. "Is the Shiraz Berry the Biggest Looser? The double edged sword of cell death in grapevines," *Australian and New Zealander Grapegrower and Wine Maker* 583, (2012): 42-44.

Eggplant (page 94)
Hand, D. W., J. Warren Wilson, and B. Acock. "Effects of light and CO2 on net photosynthesis rates of stands of aubergine and Amaranthus," Annals of Botany 71, no. 3 (1993): 209-216.

Pork (page 98)
Pearce, S. C., N. K. Gabler, J. W. Ross, J. Escobar, J. F. Patience, R. P. Rhoads, and L. H. Baumgard. "The effects of heat stress and plane of nutrition on metabolism in growing pigs," *Journal of Animal Science* 91, no. 5 (2013): 2108-2118.

Tomatoes (page 100)
Sato, S., M. Kamiyama, T. Iwata, N. Makita, H. Furukawa, and H. Ikeda. "Moderate increase of mean daily temperature adversely affects fruit set of Lycopersicon esculentum by disrupting specific physiological processes in male reproductive development," *Annals of Botany* 97, no. 5 (2006): 731-738.

Webb, L., R. Darbyshire and I. Goodwin. "Climate Change: Horticulture," in *Encyclopeadia of Agriculture and Food Systems*, vol 2, edited by NV Alfen, 266-283. San Diego: Elsevier, 2014.

Cauliflower (page 102)
Donald, E. Caroline, and Ian J. Porter. "Clubroot in Australia: the history and impact of Plasmodiophora brassicae in Brassica crops and research efforts directed towards its control," *Canadian Journal of Plant Pathology* 36, no. sup1 (2014): 66-84.

Kangaroo (page 106)
Renfree, Marilyn B., and Geoff Shaw. "Diapause," *Annual Review of Physiology* 62, no.1 (2000): 353-375.

Beetroot (page 108)
"Impacts of Climate on the Australian Vegetable Industry," Gordon Rogers, Applied Horticultural Research, published 2003, http://www.vegetableclimate.com/category/crop-impacts/

Cheese (page 112)
Dunshea, Frank R., Brian J. Leury, Fahri Fahri, Kristy DiGiacomo, Alex Hung, Surinder Chauhan, Iain J. Clarke et al. "Amelioration of thermal stress impacts in dairy cows," *Animal Production Science* 53, no. 9 (2013): 965-975.

Kefford, B., M.P. Christian, B.J. Sutherland, J.J. Mayes, and & C. Grainger. "Seasonal influences on cheddar cheese manufacture: influence of diet quality and stage of lactation," *Journal of Dairy Research* 62, no. 3 (1995): 529-537.

Chapter 4: Seafood

Octopus (page 116)
Andre, Jessica, Malcolm Haddon, and Gretta T. Pecl. "Modelling climate-change-induced nonlinear thresholds in cephalopod population dynamics," *Global Change Biology* 16, no. 10 (2010): 2866-2875.

Kailola, P.I., M.J. Williams, P.C. Stewart, R.E. Reichelt, A. McNee and C. Grieve. *Australian Fisheries Resources*. Canberra: Bureau of Resource Sciences and the Fisheries Research and Development Corporation, 1993.

Pörtner, Hans O., Martina Langenbuch, and Basile Michaelidis. "Synergistic effects of temperature extremes, hypoxia, and increases in CO2 on marine animals: From Earth history to global change," *Journal of Geophysical Research: Oceans* (1978–2012) 110, no. C9 (2005).

Watson, Sue-Ann, Sjannie Lefevre, Mark I. McCormick, Paolo Domenici, Göran E. Nilsson, and Philip L. Munday. "Marine mollusc predator-escape behaviour altered by near-future carbon dioxide levels," *Proceedings of the Royal Society B: Biological Sciences* 281, no. 1774 (2014): 20132377.

Salmon (page 118)
Adams, M. B., and B. F. Nowak. "Amoebic gill disease: sequential pathology in cultured Atlantic salmon, Salmo salar L," *Journal of Fish Diseases* 26, no. 10 (2003): 601-614.

Hobday, A.J. and E.S. Poloczanska. "Marine fisheries and aquaculture," in *Adapting Agriculture to Climate Change*, edited by Chris Stokes and Mark Howden, 205-228. Australia: CSIRO, 2011.

Pörtner, Hans O., Martina Langenbuch, and Basile Michaelidis. "Synergistic effects of temperature extremes, hypoxia, and increases in CO2 on marine animals: From Earth history to global change," *Journal of Geophysical Research: Oceans* (1978–2012) 110, no. C9 (2005).

Wynne, James W., Mathew T. Cook, Barbara F. Nowak, and Nicholas G. Elliott. "Major histocompatibility polymorphism associated with resistance towards amoebic gill disease in Atlantic salmon (Salmo salar L.)," *Fish & Shellfish Immunology* 22, no. 6 (2007): 707-717.

Scallops (page 124)
Richards, Russell G., Andrew T. Davidson, Jan-Olaf Meynecke, Kerrod Beattie, Vanessa Hernaman, Tim Lynam, and Ingrid E. van Putten. "Effects and mitigations of ocean acidification on wild and aquaculture scallop and prawn fisheries in Queensland, Australia," *Fisheries Research* 161, (2015): 42-56.

Watson, Sue-Ann, Lloyd S. Peck, Paul A. Tyler, Paul C. Southgate, Koh Siang Tan, Robert W. Day, and Simon A. Morley. "Marine invertebrate skeleton size varies with latitude, temperature and carbonate saturation: implications for global change and ocean acidification," *Global Change Biology* 18, no. 10 (2012): 3026-3038.

Prawns/Shrimp (page 130)
Hobday, Alistair J., and Janice M. Lough. "Projected climate change in Australian marine and freshwater environments." *Marine and Freshwater Research* 62, no. 9 (2011): 1000-1014

Hobday, A.J. and E.S. Poloczanska. "Marine fisheries and aquaculture," in *Adapting Agriculture to Climate Change*, edited by Chris Stokes and Mark Howden, 205-228. Australia: CSIRO, 2011.

Richards, Russell G., Andrew T. Davidson, Jan-Olaf Meynecke, Kerrod Beattie, Vanessa Hernaman, Tim Lynam, and Ingrid E. van Putten. "Effects and mitigations of ocean acidification on wild and aquaculture scallop and prawn fisheries in Queensland, Australia," *Fisheries Research* 161, (2015): 42-56.

Barramundi (page 132)
Hobday, A.J. and E.S. Poloczanska. "Marine fisheries and aquaculture," in *Adapting Agriculture to Climate Change*, edited by Chris Stokes and Mark Howden, 205-228. Australia: CSIRO, 2011.

Kailola, P.I., M.J. Williams, P.C. Stewart, R.E. Reichelt, A. McNee, and C. Grieve. *Australian Fisheries Resources*. Canberra: Bureau of Resource Sciences and the Fisheries Research and Development Corporation, 1993.

Bar Cod (page p. 134)
"Banded Rock Cod (Bar Cod) Epinephelus ergastularius," NSW Department of Primary Industries: Fishing and Aquaculture, accessed October 2014, http://www.dpi.nsw.gov.au/fisheries/recreational/saltwater/sw-species/bar-cod

Oysters (page 138)
Butt, Daniel, Kim Shaddick, and David Raftos. "The effect of low salinity on phenoloxidase activity in the Sydney rock oyster, Saccostrea glomerata," *Aquaculture* 251, no. 2 (2006): 159-166.

Parker, Laura M., Pauline M. Ross, Wayne A. O'Connor, Larissa Borysko, David A. Raftos, and Hans-Otto Pörtner. "Adult exposure influences offspring response to ocean acidification in oysters," *Global Change Biology* 18, no. 1 (2012): 82-92.

Raftos, D., E. Thompson, L. Parker, P. Ross, W. O'Connor, and P. Goncalves. "Oysters in a changing world: potential impacts of global change on disease in oysters," *Paper presented at the 51st Australian Marine Sciences Association Conference*, Canberra, ACT, 2014.

Watson, Sue-Ann, Lloyd S. Peck, Paul A. Tyler, Paul C. Southgate, Koh Siang Tan, Robert W. Day, and Simon A. Morley. "Marine invertebrate skeleton size varies with latitude, temperature and carbonate saturation: implications for global change and ocean acidification," *Global Change Biology* 18, no. 10 (2012): 3026-3038.

Yellow-eye Mullet (page 140)
Dixson, Danielle L., Philip L. Munday, and Geoffrey P. Jones. "Ocean acidification disrupts the innate ability of fish to detect predator olfactory cues," *Ecology Letters* 13, no. 1 (2010): 68-75.

Kailola, P.I., M.J. Williams, P.C. Stewart, R.E. Reichelt, A. McNee, and C. Grieve. *Australian Fisheries Resources*. Canberra: Bureau of Resource Sciences and the Fisheries Research and Development Corporation, 1993.

Pörtner, Hans O., Martina Langenbuch, and Basile Michaelidis. "Synergistic effects of temperature extremes, hypoxia, and increases in CO2 on marine animals: From Earth history to global change," *Journal of Geophysical Research: Oceans* (1978–2012) 110, no. C9 (2005).

Chapter 5: Fruits and Sweets

Sugar Cane (page 144)
Stokes, Chris, and Mark Howden, eds. *Adapting agriculture to climate change: preparing Australian agriculture, forestry and fisheries for the future*. CSIRO Publishing, 2010.

Lemon (page 146)
"Growing lemons in Australia - a production manual," Sandra Harris, NSW Department of Primary Industries, published 1 July 2004, http://www.dpi.nsw.gov.au/agriculture/horticulture/citrus/lemon-manual

Idso, Sherwood B., and B.A. Kimball. "CO2 enrichment of sour orange trees: 13 years and counting." *Environmental and Experimental Botany* 46, no. 2 (2001): 147-153.

Bananas (page 149)
Emanuel, K.A. "Downscaling CMIP5 climate models shows increased tropical cyclone activity over the 21st century." *Proceedings of the National Academy of Sciences* 110, no. 30 (2013): 12219-12224.

Haig, J., J. Nott, and G. Reichart. "Australian tropical cyclone activity lower than at any time over the past 550-1,500 years," *Nature* 505, no. 7485 (2014): 667-671.

Tory, K. J., S. S. Chand, J. L. McBride, H. Ye, and R. A. Dare. "Projected changes in late 21st century tropical cyclone frequency in 13 coupled climate models from phase 5 of the coupled model intercomparison project," *Journal of Climate* 26, no. 24 (2013): 9946-9959.

Apples (page 152)
Schrader, L.E., J. Zhang, and W.K. Duplaga. "Two types of sunburn in apple caused by high fruit surface (peel) temperature," *Plant Health Progress* 10, (2001): 1-5.

Thomson, G., M. McCaskill, I. Goodwin, G. Kearney, and S. Lolicato. "Potential impacts of rising global temperatures on Australia's pome fruit industry and adaptation strategies," *New Zealand Journal of Crop and Horticultural Science* 42, no. 1 (2014): 21-30.

Honey (page 154)
Le Conte, Y., and M. Navajas. "Climate change: impact on honey bee populations and diseases," *Revue Scientifique et Technique-Office International des Epizooties* 27, no. 2 (2008): 499-510.

Peaches (page 161)
Darbyshire, R., L. Webb, I. Goodwin, and E. W. R. Barlow. "Impact of future warming on winter chilling in Australia," *International Journal of Biometeorology* 57, no. 3 (2013): 355-366.

Plums (page 162)
Chambers, L. E., and M. R. Keatley. "Phenology and climate–early Australian botanical records," *Australian Journal of Botany* 58, no. 6 (2010): 473-484.

Mangoes (page 168)
"Climate and soil for successful mangoes in Western Australia," Peter Johnson, Western Australia Department of Agriculture and Food, last modified 4 November 2014, https://www.agric.wa.gov.au/mangoes/climate-and-soil-successful-mangoes-western-australia

Rajan, S. ""Phenological Responses to Temperature and Rainfall: A Case Study of Mango," in *Tropical Fruit Tree Species and Climate Change*, edited by B.R. Sthapit, V. Ramantha Rao and S. R. Sthapit, 71-96. New Delhi: Biodiversity, 2012.

Webb, L. "Horticulture," in *Adapting Agriculture to Climate Change*, edited by Chris Stokes and Mark Howden, 119-136. Australia: CSIRO Publishing, 2010.

Raspberries (page 172)
Brien, J., & R. Menzies. "Raspberry growing in NSW", NSW Agriculture, published 2002, http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0020/140249/raspberry-growing-in-nsw.pdf

Luedeling, E. "Climate change impacts on winter chill for temperate fruit and nut production: a review," *Scientia Horticulturae* 144, (2012): 218-229.

Oranges (page 174)
Aurambout, J. P., K. J. Finlay, J. Luck, and G. A. C. Beattie. "A concept model to estimate the potential distribution of the Asiatic citrus psyllid (Diaphorina citri Kuwayama) in Australia under climate change: a means for assessing biosecurity risk." *Ecological Modelling* 220, no. 19 (2009): 2512-2524.

Science researchers

Professor Snow Barlow is a plant physiologist and agricultural scientist whose research encompasses plant water-use efficiency, viticulture and impacts of climate change on agriculture, water management and global food security. He is currently Foundation Professor of Horticulture and Viticulture at the University of Melbourne.

Research: almonds, cucumber, eggplant, lemon, mangoes, onion, raspberries, sweet potato, walnuts, zucchini

Dr Brendan Cullen is a senior lecturer in grazing systems in the Faculty of Veterinary and Agricultural Sciences at the University of Melbourne. One focus of his research is assessing the impacts of climate variability and change on the dairy, sheep and beef industries, and identifying adaptation options. He has published more than 30 peer-reviewed papers on these topics.

Research: beef, dairy, lamb

Associate Professor Rob Day is a marine ecologist in the School of Biosciences at the University of Melbourne. His research focuses on the sustainable management of fisheries, especially sharks and abalone, and on the immune capacities of abalone in aquaculture. Diseases are dangerous on farms where animals are close together, so farmers try to exclude disease and maintain their animals' immune capacity at a high level.

Research: bar cod, barramundi, octopus, oyster, prawns, salmon, scallops, Yellow-eye mullet.

Dr Rebecca Darbyshire researches climate change impacts and adaptation options for the Australian fruit tree industry. She is particularly focused on understanding temperature-based effects and assessing where and when these impacts will occur. This allows industry to minimise potential damage and to identify and take advantage of likely benefits.

Research: apples, bananas, oranges, peaches, plums, tomatoes

Professor Frank Dunshea is head of the Department of Agriculture and Food Systems at the University of Melbourne. He is a fellow of the Nutrition Society of Australia and chairs the Australian Academy of Science's National Committee for Nutrition. His research, including on functional food and nutrition, ecompasses 700 published journals, conferences, books, patents and technical articles.

Research: pork

Associate Professor Richard Eckard is director of the Primary Industries Climate Challenges Centre based at the University of Melbourne. He is an advisor to the Australian, New Zealand and British governments and the UN's Food and Agriculture Organisation on climate change research in agriculture. He leads research on enteric methane, nitrous oxide and whole farm systems modelling of mitigation and adaptation strategies.

Research: avocado, beef, beetroot, chicken, dairy, eggplant, honey, kale, kangaroo, lamb, lemon, olives, raspberries, sweet potato, sugar cane, zucchini

Dr Sigfredo Fuentes is a senior lecturer in Wine Science at the University of Melbourne and the international co-ordinator of The Vineyard of The Future initiative, a multinational collaboration to research climate change impacts on viticulture. In the past five years, he has published 70 articles including more than 30 that have been peer-reviewed in scientific journals.

Research: grapes, rice

Dr Dorin Gupta is a member of the Department of Agriculture and Food Systems at the University of Melbourne. Her research interests includes sustainable production of cereals and legumes, with a key focus on understanding physiological and molecular stresses and efficient input resource management under changing climatic conditions. She is passionate about taking on challenges for sustainable food production and security.

Research: chickpeas, lentils, soybeans

Professor David Karoly is an atmospheric scientist with the School of Earth Sciences and the ARC Centre of Excellence for Climate System Science at the University of Melbourne. He is an internationally recognised expert in climate change and climate variability, including greenhouse climate change, stratospheric ozone depletion and interannual climate variations due to El Niño-Southern Oscillation.

Research: agro-climatic regions

Dr Anneline Padayachee is involved in research and teaching, particularly in the area of nutritional food science, at the University of Melbourne. She was named the 2012 National Fresh Science winner and the 2013 recipient for The Nutrition Society of Australia's Excellence in Nutrition and Dietary Fibre Research Award.

Research: carrots

Dr Ian Porter is an associate professor with the Centre for AgriBioscience, a research initiative between LaTrobe University and Victoria's Department of Environment and Primary Industries. He has a extensive background in agricultural research and policy related to environmental and social sustainability.

Research: broccoli, cauliflower

Professor Michael Tausz is a plant physiologist with research interests in how crops and trees adapt to the environment, especially in managing forests and agroecosystems in the face of climate change. He leads the University of Melbourne's involvement in the Australian Grains Free Air CO2 Enrichment research, and is listed as highly cited researcher in the ISI Essential Science indicators.

Research: maize

Dr Sabine Tausz-Posch is a lecturer in crop science within the Department of Agriculture and Food Systems at the University of Melbourne. Her research focuses on understanding crop performance in a changing climate; the majority is conducted within the Australian Grains Free Air CO2 Enrichment project, where crops grow under future conditions atmospheric CO2 conditions.

Research: barley, canola, wheat

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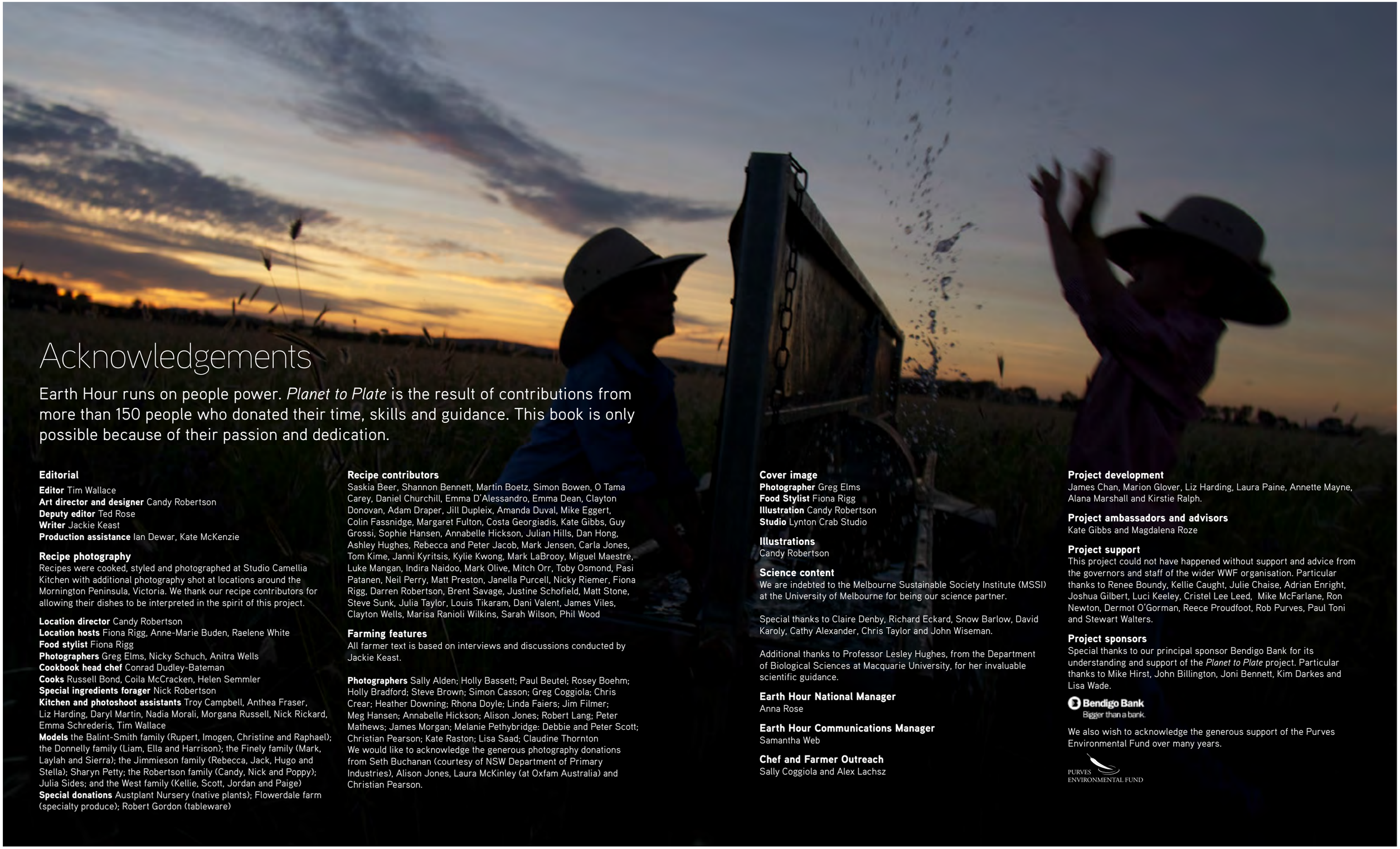

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Recipe photography
Recipes were cooked, styled and photographed at Studio Camellia Kitchen with additional photography shot at locations around the Mornington Peninsula, Victoria. We thank our recipe contributors for allowing their dishes to be interpreted in the spirit of this project.

Location director Candy Robertson
Location hosts Fiona Rigg, Anne-Marie Buden, Raelene White
Food stylist Fiona Rigg
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Cookbook head chef Conrad Dudley-Bateman
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Farming features
All farmer text is based on interviews and discussions conducted by Jackie Keast.

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Planet to Plate brings together 52 delicious recipes from Australia's top chefs in the name of celebrating and protecting our fresh produce. With mouth-watering celebrity dishes, evocative photography and firsthand stories from farmers about how rising temperatures and more extreme weather is already affecting our food, *Planet to Plate* will inspire you to live the spirit of Earth Hour, every hour.

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