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Motor transport for the homelands

Planes, Roads, Automobiles: The Realities of Life on NE Arnhem Homelands

Part — Food

Food: Diet and Nutrition on the Homelands

*Bush food, store food and health at Mata Mata and other
homelands of north-east Arnhem Land (working title)*

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This is a draft paper that will be continually updated with new information as it comes to hand.

Summary. What people eat on the homelands of north-east Arnhem Land depends on three things at once: what the country and sea provide, what can be bought and carried home from a store, and whether there is power to keep it cold. The best long record comes from Neville White's work at Donydji, an inland Yolŋu homeland, since the early 1970s. In those years about 80 per cent of the food eaten there was wild food. Now almost all meat is still hunted and all fish caught, but only about a fifth of fruit and vegetables come from the bush, and families rely more on store food from Gapuwiyak. Health studies of homelands, in Arnhem Land and in central Australia, found less diabetes, less obesity and longer lives than in the larger settlements. Store food is dear: in 2023 a fortnight's healthy food basket for a family cost \$1,105 in East Arnhem remote stores, 40 per cent more across remote stores than in a regional supermarket, and the cheapest calories are sugar, flour and oil. This paper brings those records together for Mata Mata, where no diet or health study has been done. It is a first draft. Where the record is thin, it says so. Bush foods matter as well: the Kakadu plum, ṇäṇ'ka-bakarra, has the highest recorded natural vitamin C of any fruit, and my paper Ancient Future sets out its food, knowledge and enterprise story (Botsman 2020).

This paper is a companion to Planes, Roads, Automobiles (Botsman 2026) and to Power: The Homelands off the Grid (Botsman 2026c). It links to the Mata Mata campaign on [isx.org.au](https://www.isx.org.au) (<https://www.isx.org.au/features/planes-roads-automobiles-and-boats>).

Contents

1. Why food.....	4
2. Donydji: more than fifty years of Neville White's work.....	5
3. Homelands and health.....	6
4. The store.....	7
5. Mata Mata: getting food home.....	8
6. Bush foods.....	9
7. Mata Mata: eating from country.....	11
8. Power and the fridge.....	13
9. What would help.....	13
10. Conclusion.....	13
Notes.....	14
Bibliography.....	17



Mrs P.B. Burarrwaga with a ṇāṇ'ka-bakarra (Kakadu plum) tree at Mata Mata, wet season 2017. The tree is in the background, about 50 metres from her house. Source: Botsman, P. (2018), Kakadu Plum, Aboriginal Knowledge, Sustainability, Science, final report to the Indigenous Land Corporation, p. 19.

https://www.workingpapers.com.au/files/papers/kakadu_plum_aboriginal_knowledge_sustainability_science_ilc_contract_no_4675_final_report_peter_botsman_0.pdf

1. Why food

The companion papers deal with planes, roads, cars, boats and power. Each comes back to food in the end. People fly, drive and charter to buy it, and they need power to keep it. Food is also the clearest link between the homelands and health. This paper sets out what is known, from the published record, about diet and nutrition on the homelands of north-east Arnhem Land, and what that means for Mata Mata.

The record for Mata Mata itself is thin. I have found no dietary survey, store study or health study of Mata Mata or the Marthakal homelands. What there is comes from Donydji, an inland homeland south of Gapuwiyak where Neville White has worked for more than fifty years, from health studies of homelands elsewhere in the Territory, and from surveys of remote store prices. I use those, and say where Mata Mata may differ.¹

2. Donydji: more than fifty years of Neville White's work

Neville White is a biological anthropologist, now an Emeritus Scholar at La Trobe University. He has worked in north-east Arnhem Land since 1971, and his research grew from population genetics into medical anthropology, nutritional health, ethnobiology and Yolŋu land management. Since 1974 he has spent about two months a year living at Donydji, now also called Gurrumala, and from 2003 he led the Mittjiwu Djaaka, or Caring for Our Community, project there, funded by philanthropy, especially through the Rotary Club of Melbourne, and built with Vietnam veteran volunteers. He was made a Member of the Order of Australia in 1998 for his research and his work with Donydji and other Yolŋu homelands.²³

His account of the diet is the longest record we have. In the early 1970s families still ranged over 3,000 to 4,000 square kilometres. Most of the diet was vegetable food gathered by women, while men went out less often and further for fish and small game, with the occasional kangaroo, wallaby or emu. About 80 per cent of the year's food was wild food. By the 2010s that had changed. Hunting and fishing were done from four-wheel drives with guns, over fewer places but bringing back more meat. Of 106 species of roots, fruits and seeds in the early diet, only about 18 to 20 were still commonly eaten. Cycad seeds, once a staple for much of the year, had become emergency food. Almost all meat was still hunted and all fish caught, but only about 20 per cent of fruit and vegetables came from the bush. Women spent more time buying store food at Gapuwiyak with the government Basics card.³

White and his colleagues also measured what that change does to the body. A 1988 study with Kerin O'Dea at a north-east Arnhem Land outstation found low blood glucose and cholesterol, the advantages, as the title put it, of a traditionally oriented life, but raised fasting insulin and triglycerides, a warning of risk if the diet moved further toward store food. A 1994 study of 425 Yolŋu at Donydji and Yirrkala found body fat lower in the long-term Donydji residents than in people living in the settlements and towns. White's own conclusion is that the homeland still protects people, but that growing reliance on store food could undo it.⁴⁵³⁶

He is also plain about hunger. At Donydji, he writes, children often say they are hungry, despite a school breakfast. Trips to town for banking and shopping, by old cars, bush taxi or charter, leave less money for food. More frequent and costly funerals add to the strain. These are the same pressures the companion papers describe at Mata Mata.³

Few studies match White's for length, and none for a Yolŋu homeland over decades. The nearest are two year-long outstation studies to the west, among non-Yolŋu neighbours. Betty Meehan recorded the food of the Anbarra (Gidjingali) people at the mouth of the

Blyth River in 1972–73 and found that bush and sea foods gave 49 per cent of energy and 82 per cent of protein. Jon Altman, at Momega (Mumeka) outstation south of Maningrida in 1979–80, found 46 per cent of energy and 81 per cent of protein came from the bush, and valued that food at 64 per cent of total cash and imputed income (Meehan 1982; Altman 1987; Altman, Bek and Roach 1995). Earlier, the 1948 American-Australian Scientific Expedition timed food gathering and measured diet at Fish Creek near Oenpelli and Hemple Bay on Groote Eylandt, and its nutrition team also worked at Yirrkala (McCarthy and McArthur 1960; McArthur, McCarthy and Specht 2000). Donald Thomson's Arnhem Land work of the 1930s is mainly about economy and ceremonial exchange (Thomson 1949). For what bush foods contain, Brand Miller, James and Maggiore (1993) compiled tables from over 1,200 samples of about 500 foods. Kerin O'Dea's best-known study took ten diabetic Mowanjum people of the Kimberley back to hunting and gathering for seven weeks, with marked falls in blood sugar and blood fats (O'Dea 1984). And a year of store and food-service sales in three remote Northern Territory communities in 2010–11 found that a quarter of food spending went on non-alcoholic drinks, 15.6 per cent on sugar-sweetened drinks, and only 2.2 per cent on fruit (Brimblecombe and others 2013).

3. Homelands and health

The best-known evidence that homelands are good for health comes from central Australia. Robyn McDermott, Kerin O'Dea and colleagues surveyed 826 Aboriginal adults in 1987–88 and followed them for seven years. People living on homelands had less diabetes, less high blood pressure and less overweight than people in the centralised communities. They were less likely to be hospitalised, and less likely to die; the mean age at death was 58 on the homelands and 48 in the centralised communities. A ten-year follow-up at Utopia, a community of sixteen outstations with no central settlement, found deaths about 38 per cent below the Territory Indigenous rate and heart-disease admissions well under half. The authors credit outreach primary care, the outstation way of life, with more physical activity, better diet and little alcohol, and connection to culture, family and land.⁷⁸

Those studies are from central Australia, not Arnhem Land, and they are a generation old. The Donydji measurements point the same way for a Yolŋu homeland. None of this has been measured at Mata Mata. What can be said is that the conditions the studies credit, outreach health care, an active life on country, wild food and little alcohol, are the conditions Mata Mata's people have chosen to keep, and that each depends on services the companion papers show are fragile.⁴⁵¹ My Kakadu plum paper makes the same link from the bush side: the fruit "is associated with the endurance, physicality and good health that came with the traditional Aboriginal way of life", and harvesting it encourages people "to be on their own country and to walk and appreciate their lands" (Botsman 2020).

The main paper of this set, Planes, Roads, Automobiles, reports the same central Australian figures and adds an Arnhem Land study: among 298 adults, Burgess and colleagues found more caring for country associated with lower body mass, blood

pressure, diabetes and psychological distress. The power, roads and bush taxi papers describe the services on which these conditions depend.⁹¹⁰

4. The store

Most store food in north-east Arnhem Land comes by barge or road into Nhulunbuy, Galiwin'ku, Gapuwiyak and the other communities, and from there to the homelands by car, boat or plane. The NT Market Basket Survey has costed the same baskets in remote stores for more than twenty years. In 2023 a fortnight's Healthy Food Basket for a family, based on the Australian Dietary Guidelines, cost on average \$1,017 in NT remote stores and \$1,105 in East Arnhem remote stores. A basket built on what people actually buy cost \$1,167 in East Arnhem. Across the Territory the healthy basket cost 40 per cent more in remote stores than in a regional supermarket, and its remote price rose 13 per cent between 2021 and 2023.¹¹

Price shapes the diet. Store-turnover studies in remote communities in the early 1990s found white sugar, flour, bread and meat supplying more than half of all food energy, with too little fibre and too few vitamins. Julie Brimblecombe and Kerin O'Dea, working with store data from an Arnhem Land island community in 2005, showed why: sugar, cooking oil, rice, margarine and white flour are the cheapest calories in the store, and fresh vegetables, meat and fruit cost many times more for the same energy. Brimblecombe's doctoral work on nutrition was done at Galiwin'ku, the Marthakal hub.¹²¹³

At Galiwin'ku the store is not one store. A 2025 submission from the Walking Together Program says the ALPA store is the only outlet there with a healthy food policy, that its hours are inconsistent, and that people who work regular hours end up at other shops and takeaways where food is dearer and less healthy. It asks for lower prices on meat, seafood, fruit and vegetables, a nutrition policy for every outlet, and a subsidy for barge freight.¹⁴

The Arnhem Land Progress Aboriginal Corporation (ALPA)

When I first came to Arnhem Land there was only quite poor supermarket shopping, with no fresh fruit and vegetables, and certainly no Aboriginal staff in the supermarkets. The Arnhem Land Progress Aboriginal Corporation (ALPA) has changed all that. It has revolutionised the idea of the store, and made the supermarkets better, more affordable and more Aboriginal-focused.

ALPA was founded in 1972 as a co-operative of community stores in East Arnhem Land; before that the stores were owned and run by the Methodist mission. Its own history describes the journey “from small, counter sales stores in tin sheds” to services across the Northern Territory and Far North Queensland. On nutrition, it worked with Monash University on Healthy Stores 2020 across 20 remote community stores, and it leads Good Food People, a national program to train First Nations people working in remote community stores. Sources:

<https://www.alpa.asn.au/history> ; <https://www.alpa.asn.au/health-nutrition>

That leaves a question I cannot answer. This paper describes less reliance on bush food, a craving for sugary drinks, and bush food that may be sold rather than eaten (sections 2 and 7). Have better, cheaper, more Aboriginal-focused stores also been part of a move away from the traditional diet?

The town itself faces change. Rio Tinto expects the last bauxite at Gove to be mined in 2029, and the ABC has reported residents worried about planning for Nhulunbuy after mining and businesses saying they will leave. Food prices and supply in the region may change with it, which makes the homelands' own food, and the means to store it, more important.¹⁵¹⁶

For a homeland, the store price is only the start. The food then has to get home. The companion papers show what that costs at Mata Mata: a long dirt road that is cut in the wet, no reliable community vehicle, bush taxis and air charters. Mata Mata has no store of its own that I can document.⁹¹⁷¹

5. Mata Mata: getting food home

Mrs P.B. Burarrwaja (1956–2018) was an outstanding leader of Mata Mata and one of the first fully trained Yolŋu teachers in north-east Arnhem Land. She was a pioneer of Mata Mata and of the homelands movement. Bāpa Sheppy, the Rev. Harold Shepherdson of the Elcho Island mission, was the first to note that she and her husband were teaching their children in the bush at the Gi'kal outstation. She was a qualified Aboriginal Health Worker and the main Yolŋu person involved in setting up the Marthakal Homeland Health service, and at the end of her life she chaired Marthakal's board. Bringing Bushlight to Mata Mata was her initiative, trailblazing as ever.¹⁸

Her answer to food was pooling. In the wet season, when vehicles cannot cross the creeks and rivers, Centrelink accounts were pooled so that the community could charter a flight, buy food and share it out. That is food security done by the community itself, with the cost of a charter added to every kilo.¹⁹

Mata Mata sits on the Arafura Sea, so its wild food is not Donydji's. People hunt, fish and gather: fish; maypal, or shellfish, including oysters and mussels; mangrove worms; turtle and dugong; and bush fruits, among them the Kakadu plum, ŋäŋ'ka-bakarra in the Yolŋu Matha dictionary, a name I hear used at Mata Mata for bush plums generally, and other fruits and berries in season. Maypal, in the dictionary, covers shellfish, crustaceans, mangrove worms and grubs. The table gives the dictionary's names for the common bush fruits of the region. Store food is bought at the supermarket in Nhulunbuy or the store at Galiwin'ku. What I have not found is a published record of how much of the diet wild food makes up at Mata Mata, or how that has changed. It should be recorded, by and with the people who do the hunting, fishing and gathering.²⁰²¹ Section 6 says more about bush foods.

Fruit (English and botanical names)	Yolŋu Matha name in the CDU dictionary	Dictionary gloss
Kakadu plum, Terminalia	ŋäŋ'ka-bakarra (also	edible green fruit; Billygoat

ferdinandiana	ṇaṇ'ṇabakarra)	Plum, Green Plum
Green plum, Buchanania obovata	munydjutj; also birrgi', wutpurr	Green Plum, Wild Plum; berry ripe at the end of the dry
Red or bush apple, Syzygium suborbiculare	burumu'; also rruṇunhdha	tree with edible red apples; Bush Apple
Cocky apple, Planchonia careya	dhaṇgi'	Bush Mango, Billy-goat Plum, Cocky-apple tree
Black plum or bush currant, Vitex glabra	wuṇḍaṇ'	edible fruit; Bush Currant, Black Plum
Native or wild grape, Ampelocissus or Cissus	djälulu'	Wild Grape
White currant, Flueggea virosa	not found in a search of the dictionary	—

Names are as the dictionary gives them; clans and languages differ, and the people of Mata Mata may use other names.²¹

Numbers matter here too. In October 2026 more than 100 people are living at Mata Mata in five houses and the tents beside them, and funerals bring 100 to 200 more. Feeding that many people means more store food bought and carried, more pressure on the hunting and fishing grounds nearby, and more food to keep cold.²⁰²²

6. Bush foods

Mata Mata people eat from the sea and from the bush. From the sea and the shore come fish; maypal, the shellfish, among them oysters and mussels; mangrove worms; and turtle and dugong. From the bush come the Kakadu plum, which Yolṇu call ṇaṇ'ka-bakarra, other bush plums, and berries in their seasons. Section 5 and its table give the dictionary names. This section looks at the one bush fruit that has been studied closely, the Kakadu plum, drawing on my longer paper Ancient Future: The “Kakadu Plum” Story.²²

The nutrition is remarkable. Kakadu plum (*Terminalia ferdinandiana*) first gained scientific recognition in 1982 as the fruit with the highest recorded level of natural vitamin C, up to 50 times that of oranges. It has about five times the antioxidant level of blueberries, and it contains vitamin E and lutein, “the eye vitamin”. It also has a high ratio of potassium to sodium, which may help in foods made to reduce high blood pressure. Aboriginal people knew its value long before science did. It was eaten for vitality and energy on long walks, and used for headaches, as an antiseptic and for swollen joints. A preparation from the inner bark treated sores, boils, wounds and scabies. It also keeps food: in trials it extended the shelf life of prawns from two to four days to up to fourteen.²²

It is also a story of knowledge. The fruit forms and ripens from September to June, often with a first crop in December and a second in May or June. In north-east Arnhem Land almost every plant belongs to one of the two moieties, but ṇaṇ'ka-bakarra seems to stand outside the gurruṭu kinship system, as something like a public good that belongs to all. When searching for it, the harvester calls the fruit by name, and the tree is thanked and remembered as a relative would be. Mosaic burning by people who know the country

helps the bush orchards bear. Mrs P.B. Burarrwaja recorded a talk on ṇṇ'ka-bakarra, and the photograph at the start of this paper shows her with a ṇṇ'ka-bakarra tree near her house at Mata Mata; and her photograph in the paper shows food being gathered at Mata Mata with young ṇṇ'ka-bakarra seedlings in the foreground. The paper also records a warning from Will Stubbs: many plants known to elders a generation ago are not known to a large share of young Yolṇu.²²

And it is an enterprise story. The industry is in its infancy: about 5 tonnes were produced in 2018, all sold in Australia. An Aboriginal harvester at a community hub was paid about \$20 a kilo for unprocessed fruit. In Broome one family gathered 255 kilos in two weeks and earned \$5,000, and in 2016 and 2017 Aboriginal corporations in Broome and Wadeye bought more than eight tonnes from harvesters and paid out \$160,000. Frozen, the fruit keeps for up to four years. The paper names Yirrkala as one of five centres for processing and storage, and argues that wild-harvest income should be tax free and should not cut Centrelink payments, because a good fortnight's harvest can otherwise reduce a payment to nothing. It also argues that remote communities with regular flights could join a harvest network.²²

For a homeland the point is a double one. Bush fruit in season is the best vitamin C there is, and it is free, while fresh fruit from the store is dear and travels a long way (section 4). Harvesting it also keeps people walking their country, the active life on country that the health studies in section 3 link to better health. The paper notes that when money runs out, as it often does in remote Australia, Kakadu plum is the kind of survival food people turn to. A harvest for sale would also need freezers, which brings the story back to power (section 8). How much bush fruit, fish and shellfish people at Mata Mata actually eat has not been recorded, and it should be.²²

The only thing I would say about the food is this. In the last week, while we were between jobs at Mata Mata, I walked through the forest with Mervyn Garrawitja and Marcus Gurruwiwi, and what is really apparent, and it is a bit confirmed by the Neville White research, is that there is an unlimited number of bush foods still there that could be eaten, but the knowledge of them has been lost. The trouble is that people are not travelling through the bush as much, and so they are losing the knowledge of those small edible fruits.

I remember when I first came to Gi'kal 20 years ago, travelling with the late Jalu Gurruwiwi and the late Dopiya Gurruwiwi (née Yunupinṇu). We would go maybe 30 or 40 metres in the car, and then there would be a yell from the back: "Stop!" I would stop the car, and Dopiya and her daughters and granddaughters would go out into the bush, maybe 50 to 100 metres, to a tree she had seen from the car that had fruit. They would fill buckets or bags with that fruit, bring it back to the car, and we would go on. The same thing would happen again and again, all the way to Gi'kal and Mata Mata. That knowledge is starting to be lost, and so it is something to be revived.

Honey matters as much as any fruit. Sugarbag, the honey of the small native stingless bees (*Trigona* species), was the great sweetness of the old diet, and going after it is still one of the things people most look forward to on country. The Charles Darwin University

Yolngu Matha dictionary gives guku for honey (especially without wax), beehive and sugarbag, and now also for sugar and syrup; wuṇay' and guṇbala for wild honey and the hive; and separate names for the bees and their honey, among them baṅgitj, whose sugarbag is gathered near the ground, yarrpany, named for the long entrance tunnel of its hive, and birrkuda, the “cheeky bee”. It also records ḍimbuka', the closely woven dilly bag for carrying wild honey, and baypay, a good place to get honey (CDU n.d.). A language with that many words for bees and honey is telling us how much they mattered.

Natasha Fijn, who spent time on homelands in north-east Arnhem Land, describes sugarbag season as “a highly anticipated activity” in which “Yolngu men, women and children undertake excursions into the bush in search of these tiny bees to extract honey”. Honey, the bees and “the entire sugarbag complex are significant to Yolngu, not just as an important source of food, but culturally as well”, and Sugarbag Dreaming is celebrated “in song, dance, painting and ceremony” (Fijn 2014). Honey runs through the Mata Mata story too. On the 1964 walk from Mata Mata to Cape Wilberforce the children “slept, ate, played, dug yams, ate oysters, collected honey” (Botsman 2024). That walk was re-made in 2016 and filmed as *Remaking the Pathway*, and Dhaṇu dhuka is the written companion to the film. On the road with Gälpu leaders there is “frequent stopping ... collecting bush tucker like bush plums (munydjutj) and honey” (Botsman n.d.). Wild honey is one of the big stories danced and sung in bunguldjama (Botsman 2022). Like Kakadu plum, sugarbag is free, it comes from walking the country, and it is a sweetness that does not come out of a can or a bottle.

I have seen what this knowledge looks like in practice. Mrs P.B. Burarrwaja and the late Mavis Warrngilna Ganambarr, master weaver, born at Mata Mata in 1966, whose father Mowarra Ganambarr OAM was among the Yolngu elders who established the homeland (Hamby 2023), were both incredible honey hunters. Sometimes they had dogs trained to follow the scent of the honey, and they had an amazing ability to see bees flying above the treetops and follow them to particular hives. It is joyous to find wild honey. It is the sweetest honey I have ever tasted, unique, almost like a honey wine, thinner than normal honey, but so beautiful and really restorative. Their story, and that of other bush women of North East Arnhem Land, could be the subject of a future film, *Walking in the Yungar Orchard*, and I have some footage of Mavis that I hope to make into a tribute to her, a project that was going to be called *The Bush Orchard*.

7. Mata Mata: eating from country

During the funeral held at Mata Mata in October 2026, about 100 people lived on the homeland for the three or four weeks of the ceremony. In that time about ten turtles (miyapunu) were caught, and turtle was a major staple for everyone there. Maypal (oysters, shellfish and mussels) and mangrove mussels were gathered almost daily, and guya (fish) were caught regularly.²³

Hunting and gathering are a vital part of surviving on a very low income. My own estimate is that the average Aboriginal income in the homelands is less than \$15,000 a year. The 2021 Census puts the median weekly personal income of Aboriginal adults at \$328 in the Marthakal Homelands-Galiwin'ku area, about \$17,000 a year, and \$274

across East Arnhem, about \$14,250 a year. On that money people cannot buy all their food from the supermarket. They have to supplement it from the sea and the bush.²⁴

Most cooking was done on a fire, every day. Damper was a major food, eaten morning, lunch and dinner. The recipe is simple: about one cup of flour, about one cup of milk powder and a couple of teaspoons of baking powder, baked as a big flat loaf in a frying pan on the open fire. Cold storage was scarce. When I counted, there were only two freezers among about 80 people. The two numbers are from different times: about 100 people were there for the funeral, and about 80 when I counted the freezers.²³

Sugary drinks are the other side of the diet. In a very hot climate, with people dancing *bungul* (ceremonial dance) all day during ceremony, I found I needed water with electrolytes to avoid dehydration, and I wasn't even dancing, just filming. What I have seen is that people tend to get hooked on sugary drinks, such as fruit drinks, cordial mixed with water and Coke, and they become a craving, probably because of all the water lost during the day.²³

It was not the season for bush nuts and fruits. This is probably where diet has changed most. Neville White's work at Donydji (section 2) shows how much Yolŋu once relied on bush foods and fruits through the year.

People sometimes argue that fruit and vegetables should be planted on the homelands, and there has been a succession of gardens at Mata Mata in the past. The most lasting trees are the mango trees around every house, which you can see in my films, and they produce a lot of mangoes. But cyclones hit them and knock out branches. At present there are about six or seven great giant mango trees, hit hard by the cyclone, and one has been completely destroyed. Cyclones obviously take their toll on the mango trees. The great thing about *ŋäṇ'ka-bakarra* is that it grows wild every year.²³

The change began long before the freezer. Bāpa Sheppy, the Rev. Harold Shepherdson, and his wife Ella ran the mission at Milingimbi from 1928 and at Elcho Island, now Galiwin'ku, from 1942, and mission food came as rations of flour, tea and sugar. Ella Shepherdson's diary for Christmas Day 1942 at Elcho records: "Made big stew in copper 1 Wallaby & lots of peas & a little rice. Gave people small tin jam (1 for each family) 2 biscuits & ration of flour." Neville White writes that Shepherdson later supported the early homelands "by flying in some basic food staples".²⁵ Mavis Warrngilna Ganambarr remembered him in her own words: "Bapa Shepie brought me to Galiwin'ku when I was 9 years old so I could go to school" (Elcho Island Arts, quoted in Hamby 2023). I have not found Harold Shepherdson's own words on how refrigeration and electric lights changed things; the Shepherdsons' book, *Half a Century in Arnhem Land* (1981), still needs to be checked for them. My own view is that the missionaries, and then power, lights and even a single freezer, changed the way people eat. Food that once had to be hunted or gathered and eaten fresh can now be bought, stored and kept, and flour, sugar and frozen meat from the store become the easy option. Section 8 shows how thin Mata Mata's power still is, and how much of the food supply rests on it.

Ŋäŋ'ka-bakarra (Kakadu plum), along with bush plums and other nuts and berries, is also a potential business for Mata Mata, as my paper on the Kakadu plum sets out (section 6). But there is a catch. The aim is to encourage people to eat these foods, not just sell them, and that is very hard to do. Selling alone creates a roundabout economy where the money goes back to the supermarket, so the dietary benefit doesn't last. The best outcome is a harvest that feeds families first and earns income second.

8. Power and the fridge

A fridge is the difference between buying food for a fortnight and buying it for a day. Bushlight designed its systems around that. Fridges, freezers and lights sit on an essential circuit that stays on when a house runs past its daily energy budget and the other circuits are cut.²⁷

The Power paper estimates that the present Mata Mata array can carry about 30 to 35 kilowatt-hours a day without diesel, or about 6 to 7 a house. That is enough for a fridge, lights and little else. I counted two freezers among about 80 people living there, with up to 100 or more at funerals, and a freezer alone can use a good share of a house's solar budget; with that many people the generator runs day and night.²⁰ When fuel runs short or the generator fails, the fridges go first in practice, and with them fresh meat, fish and anything bought on a costly trip. Better power is food security. The staged solar plan in the Power paper is also a food plan.²⁶

9. What would help

The sources point to a few practical things, none of them new. Outreach health care that reaches the homelands, which the Utopia studies credit with much of the benefit. Store policies that make healthy food cheaper and easier to buy, at every outlet, and support for freight, which Galiwin'ku residents have asked for. Reliable cold storage on the homelands, which comes back to power. Transport that the community controls, so that the store is within reach in every season. And recording, with Yolŋu, what is still hunted, fished and gathered, so that the knowledge White saw slipping away at Donydji is kept.⁸¹⁴²²³ Support for bush harvesting would also help, so that families eat bush foods first and sell a surplus. My Kakadu plum paper argues for harvest income that does not cut Centrelink payments, for collection, processing and storage centres, including one at Yirrkala, and for a "sacred food" label that names the people who harvested the food and the land it came from (Botsman 2020).

Which of these matter most at Mata Mata, and in what order, is for the community and Marthakal to decide.

10. Conclusion

The published record says three things clearly. Homeland life, with wild food and an active life on country, has been good for Yolŋu health. Store food is dear, and the cheapest calories are the least healthy. And the shift from wild food to store food is under

way even on the homelands, pushed along by transport, money and time. For Mata Mata the record says almost nothing directly. There is no diet survey, no store study and no health study. What can be said is that food there depends on the same fragile things as everything else in these papers: a road, a car, a charter, a generator and a fridge. The work this paper still has to do is to record what people at Mata Mata actually eat, and what it costs them to get it. Bush foods such as ṇāṇ'ka-bakarra point the other way. The hope, as I put it in *Ancient Future*, is “a new synthesis of the ancient and the scientific” (Botsman 2020).

Notes

1. No dietary survey, store-turnover study or health study specific to Mata Mata or the Marthakal homelands was found for this draft (web search, 11 October 2026).
2. Neville White AM, Emeritus Scholar, La Trobe University, profile: biological anthropologist working in north-east Arnhem Land since 1971, with research widening to medical anthropology, nutritional health, ethnobiology and Yolŋu land management; community development at Donydji with Vietnam veteran volunteers and philanthropic funding, especially through the Rotary Club of Melbourne; AM in 1998.
<https://scholars.latrobe.edu.au/nwhiteam>
3. White, N. (2016), “A history of Donydji outstation, north-east Arnhem Land,” chapter 16 in N. Peterson and F. Myers (eds), *Experiments in self-determination: Histories of the outstation movement in Australia*, ANU Press. Points used here: Donydji is now also called Gurumala; White has spent about two months a year there since 1974, and from 2003 led the Mittjiwu Djaaka (Caring for Our Community) Project; in the early 1970s families ranged over 3,000–4,000 sq km, the bulk of the diet was vegetable foods foraged by women, and about 80 per cent of annual food intake was wild food; of 106 species of roots, fruits and seeds in the early diet, only about 18 to 20 are now commonly eaten (citing White 2001); cycad seeds, once a staple, are now emergency food; almost all meat is still hunted and all fish caught, but only about 20 per cent of fruit and vegetables come from the bush; women spend more time buying store food at Gapuwiyak using the government Basics card; children often say they are hungry, despite school breakfast; more frequent and extravagant funerals add to the financial burden; BMI and abdominal fat remain lower in long-term Donydji residents than in the settlements and towns (Jones and White 1994), but increasing reliance on store food could undo this. <https://press-files.anu.edu.au/downloads/press/p331981/html/ch16.xhtml>
4. O’Dea, K., White, N. G. and Sinclair, A. J. (1988), “An investigation of nutrition-related risk factors in an isolated Aboriginal community in northern Australia: advantages of a traditionally-orientated life-style,” *Medical Journal of Australia* 148(4): 177–80. The PubMed abstract describes 24 residents (18 adults, six children) of a north-east Arnhem Land outstation, with low glucose and cholesterol but raised fasting insulin and triglycerides.
<https://pubmed.ncbi.nlm.nih.gov/3277018/>
5. Jones, C. O. H. and White, N. G. (1994), “Adiposity in Aboriginal people from Arnhem Land, Australia: variation in degree and distribution associated with age, sex and lifestyle,” *Annals of Human Biology* 21(3): 207–27. AIATSIS catalogue summary: 425 Yolŋu speakers from Donydji and Yirrkala. <https://aiatsis.gov.au/collections/item/M0014101>

6. White, N. G., "In search of the traditional Australian Aboriginal diet," La Trobe University (Biological Anthropology), reproduced by Cultural Survival Australia. It describes the long-term Donydji study begun in 1985 to monitor nutritional status and risk factors for diabetes and cardiovascular disease. The publication details of the original were not confirmed for this draft.
https://www.culturalsurvival.org.au/ref_docs/In%20search%20of%20the%20Traditiona%20Australian%20Aboriginal%20Diet.pdf
7. McDermott, R., O'Dea, K., Rowley, K., Knight, S. and Burgess, P. (1998), "Beneficial impact of the Homelands Movement on health outcomes in central Australian Aborigines," Australian and New Zealand Journal of Public Health 22(6). Baseline survey of 826 adults in 1987-88, follow-up of 416; homelands residents had lower prevalence of diabetes (RR 0.77), hypertension (RR 0.66) and overweight or obesity (RR 0.70), were less likely to die (RR 0.56) and less likely to be hospitalised (RR 0.79); mean age at death 58 against 48 years.
<https://doi.org/10.1111/j.1467-842X.1998.tb01464.x>
8. Rowley, K. G., O'Dea, K., Anderson, I., McDermott, R. and others (2008), "Lower than expected morbidity and mortality for an Australian Aboriginal population: 10-year follow-up in a decentralised community," Medical Journal of Australia 188(5): 283-87. Utopia, 296 people screened in 1995 and followed to 2004: all-cause mortality SMR 0.62 against the NT Indigenous population; CVD hospitalisation 13 against 33 per 1,000 person-years. The authors point to outreach primary care, outstation living (physical activity, diet, limited alcohol) and connectedness to culture, family and land.
<https://www.mja.com.au/journal/2008/188/5/lower-expected-morbidity-and-mortality-australian-aboriginal-population-10-year>
9. Botsman (2026), Planes, Roads, Automobiles; Botsman (2026a), Roads: The Central Arnhem Highway; Botsman (2026), Bush Taxis. Distances, vehicles and charters are those papers', not re-argued here.
10. Burgess, C. P. et al. (2009), "Healthy country, healthy people: the relationship between Indigenous health status and 'caring for country'," Medical Journal of Australia 190(10): 567-572. 298 adults in an Arnhem Land community.
11. NT Health, Northern Territory Market Basket Survey 2023 (21st survey; summary dated 8 April 2024): 54 remote stores; Healthy Food Basket (a fortnight's food for a family, based on the Australian Dietary Guidelines) averaged \$1,017 in NT remote stores and \$1,105 in East Arnhem remote stores; Current Diet Basket \$1,108 and \$1,167; the healthy basket cost 40 per cent more in remote stores than in district-centre supermarkets (60 per cent in 2017); remote-store healthy basket up 13 per cent since 2021.
<https://digitallibrary.health.nt.gov.au/entities/publication/15f8ec86-d3b8-4610-8c3f-ba440c258fe5> ; data: <https://data.nt.gov.au/dataset/nt-market-basket-survey-2023>
12. Lee, A. J., O'Dea, K. and Mathews, J. D. (1994), "Apparent dietary intake in remote Aboriginal communities," Australian Journal of Public Health 18(2): 190-97. Store-turnover study of six remote communities: white sugar, flour, bread and meat gave more than 50 per cent of apparent energy; fibre and several nutrients, including folate, were low.
<https://eprints.qut.edu.au/66137/>
13. Brimblecombe, J. K. and O'Dea, K. (2009), "The role of energy cost in food choices for an Aboriginal population in northern Australia," Medical Journal of Australia 190(10). Island community of about 1,700 people, 550 km from a major centre, store data for three months in

- 2005; sugar, cooking oil, rice, margarine and white flour gave energy at the lowest cost, fresh vegetables, meat and fruit at a much higher cost. Brimblecombe's doctoral work on nutrition improvement was done at Galiwin'ku (Charles Darwin University thesis, "Enough for rations and a little bit extra"). <https://www.mja.com.au/journal/2009/190/10/role-energy-cost-food-choices-aboriginal-population-northern-australia> ; <https://territorystories.nt.gov.au/10070/660391/0/397>
14. Walking Together Program, "Access to healthy and affordable food in Galiwin'ku: Ideas from the Walking Together Program," submission published on the National Indigenous Australians Agency website, May 2025. It says the ALPA store is the only outlet in Galiwin'ku with a healthy food policy, that its hours are inconsistent, that people who work rely on other shops where food is dearer and less healthy, and it asks for lower prices on meat, seafood, fruit and vegetables, a community-wide nutrition policy and subsidies for barge freight. https://www.niaa.gov.au/sites/default/files/documents/2025-05/22_SubRef.pdf
 15. Rio Tinto, "Gove" operations page: last bauxite expected to be mined in 2029. <https://www.riotinto.com/en/operations/anz/gove> (read 11 October 2026).
 16. ABC News, "Mining giant Rio Tinto accused of abandoning NT town of Nhulunbuy to an uncertain future," 4 July 2026. <https://www.abc.net.au/news/2026-07-04/nt-nhulunbuy-transition-gove-rio-tinto-mine-closure/106831716>
 17. Bushlight, Case Study 28, Mata Mata, February 2009: before solar, an 18 kVA generator ran about 15 hours a day; Mata Mata described as a three-hour drive from Nhulunbuy and accessible only by air in the wet season. <https://www.cfat.org.au/s/Bushlight-Case-Study-28-Mata-Mata.pdf>
 18. See the standard note on Mrs P.B. Burarrwanga: Mata Mata Productions, "Bäpurru" (teacher; djungayi), <https://matamataproductions.vhx.tv/bapurru> ; Gi'kal bush teaching and Marthakal chair, Peter Botsman, personal communication, 2026; health service, R. Trudgen, Why Warriors (2020), <https://whywarriors.com.au/2020/08/phyllis-b-burarrwangas-dry-leaves-story/> ; Bushlight, ISX Mata Mata project page and CAT interview, <https://www.cfat.org.au/a-mata-mata-voice-to-empower-my-people>
 19. Botsman (2026), Planes, Roads, Automobiles, section on pooling. Peter Botsman, firsthand account, 6 October 2026.
 20. Peter Botsman, personal observation, Mata Mata, October 2026.
 21. Yolŋu Matha dictionary, Charles Darwin University, <https://yolngudictionary.cdu.edu.au> (searched 11 October 2026): ṇāṇ'ka-bakarra, Terminalia ferdinandiana (id 6202); munydjutj (5692), birrgi' (814), wutpurr (7850), Buchanania obovata; burumu' (1026), rruṇunhdha (7078), Syzygium suborbiculare; dhaṅgi', Planchonia careya (1848); wuṇḍaṇ', Vitex (7979); djälulu', wild grape (2456); maypal, shellfish, crustaceans, mangrove worms and grubs (5278). No entry was found for white currant (Flueggea virosa). The use of ṇāṇ'ka-bakarra for bush plums generally is Peter Botsman's observation, October 2026.
 22. Botsman, P. (2020), "Ancient Future: The 'Kakadu Plum' Story, Food and Knowledge from Aboriginal Australia for the Twenty First Century," Working Papers, 7 January 2020: names of the fruit including ṇāṇ'ka-bakarra (p. 2, p. 25); traditional uses (pp. 3-4); seasons, moieties and gurruṭu (pp. 3-5); Stubbs quotation (pp. 5-6); vitamin C, antioxidants, lutein, potassium (p. 7);

- prawn trials (p. 10); industry size, prices, harvest incomes, storage, Centrelink and Yirrkala (pp. 12–20); burning and harvest network (pp. 20–21); sources and photograph by Batumbil Burarrwanga (pp. 26–27). <https://www.workingpapers.com.au/papers/ancient-future-kakadu-plum-story-food-and-knowledge-aboriginal-australia-twenty-first-century> (PDF: https://www.workingpapers.com.au/files/papers/ancient_future-the_kakadu_plum_story_food_knowledge_21c_0.pdf)
23. Peter Botsman, personal observation, Mata Mata, October 2026: about 100 people for the three or four weeks of the funeral; about ten turtles caught; maypal and mangrove mussels gathered almost daily; fish caught regularly; cooking on fires; damper and its recipe; two freezers among about 80 people at the time of counting; sugary drinks and dehydration during bungul; past gardens, the mango trees and cyclone damage. Spellings from the Yolŋu Matha dictionary, Charles Darwin University (searched 12 October 2026): miyapunu, turtle (generic), sea mammal; गया, fish (generic); bungul, ceremony, ritual celebration, song with didjeridu and tapsticks, may be accompanied by dancing. <https://yolngudictionary.cdu.edu.au>
24. Australian Bureau of Statistics, Census 2021, median weekly personal income, Aboriginal and Torres Strait Islander people aged 15+: Marthakal Homelands–Galiwin’ku (IARE706004) \$328; East Arnhem LGA \$274; annual figures are weekly × 52. The under-\$15,000 figure is Peter Botsman’s own estimate. <https://abs.gov.au/census/find-census-data/quickstats/2021/IARE706004> ; <https://abs.gov.au/census/find-census-data/community-profiles/2021/LGA71300>
25. Ella Shepherdson, diary, Elcho Island, 25 December 1942, quoted at Past Masters, “Mission Christmas & New Year”: <https://www.pastmasters.org.au/mission-christmas--new-year.html>; arrival at Milingimbi 1928 and move to Elcho 1942, Past Masters, <https://pastmasters.net/milingimbi.html>; White (2016), chapter 16 (note 3), on Shepherdson “flying in some basic food staples”: <https://press-files.anu.edu.au/downloads/press/p331981/html/ch16.xhtml>; E. Shepherdson (1981), *Half a Century in Arnhem Land*, not yet consulted for refrigeration or electric lights, AIATSIS catalogue: <https://aiatsis.gov.au/collections/item/M0039177>. The point about freezers, lights and power changing diet is the author’s view.
26. Botsman (2026c), *Power: The Homelands off the Grid*, sections 4 and 5: Bushlight energy budgets, the essential circuit for fridge, freezer and lights, the estimated 30 to 35 kWh a day the present Mata Mata array can carry, and more than 100 people resident in October 2026.
27. Bushlight, *Renewable Energy Systems* booklet, November 2010: fridge, freezer and lights on a separate essential circuit that stays on when the discretionary circuit is cut. <https://www.cfat.org.au/s/RE-Booklet-Final-Nov-2010.pdf>

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