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Decolonising food regulatory frameworks: importance of recognising traditional culture when assessing dietary safety of traditional foods

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As interest in Australian native products continues to grow worldwide, Aboriginal and Torres Strait Islander peoples (First Peoples) are striving to be industry leaders in the production of their traditional foods that are being developed for commercial markets. To successfully gain market approval both within Australia and globally, food regulatory authorities require at least a documented history of safe use to indicate dietary safety. Moreover, many countries also require compositional analysis and safety data to further support their safe human consumption. However, safety data are lacking for many of these traditional food items and the history that surrounds their safe use has rarely been recorded in written form, but rather passed on through cultural practices and language. This review evaluates the suitability of current frameworks for assessing the dietary safety of traditional foods and highlights the food-safety regulatory hurdles currently felt by First Peoples and their businesses attempting to enter the Australian native foods industry. These issues also extend to the requirements of food regulatory authorities around the world, when assessing the market eligibility of traditional food items. Potential solutions to these problems are discussed, including new proposed processes that can be incorporated into the current food regulatory frameworks. Importantly, these proposed processes would allow the dietary risk assessment of traditional foods to be completed in a manner that better accommodates the stories, traditional knowledge and interests of First Peoples, while also meeting the safety data requirements set out by regulatory bodies both within Australia and around the world.

Key words: Novel food safety: Indigenous culture: Australian native foods: Aboriginal bush foods: Food policy

The various Aboriginal and Torres Strait Islander populations of Australia (collectively referred to hereinafter as ‘First Peoples’) have been using the native plants of the continent as both a source of medicine and as food for

tens of thousands of years^(1–3). First Peoples’ knowledge of the continent’s flora and fauna is leading to the mainstream discovery of native foods that offer a range of environmental and health benefits, including: sustainable

Abbreviations: FSANZ, Food Standards Australia New Zealand; IPCS, International Program on Chemical Safety; TK, traditional knowledge.

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food crops that are drought and bushfire-tolerant^(4,5); the often sought-after ‘superfoods’ that are nutrient-rich and possess a range of functional and medicinal properties⁽⁶⁾ and a broad range of uniquely flavoured foods that are both redefining and adding excitement to Australia’s traditional gastronomy. In support of the growing native foods industry, Australian state governments have launched various incentives for small business start-ups, several industry-led programmes have been developed and research initiatives have been launched across the country.

First Peoples have been actively working within their economies and trading natural resources, including their traditional plant foods for thousands of years^(7–9). Today, however, we are seeing the commercialisation of a number of these traditional plant products and the emergence of a contemporary native foods and botanicals industry within Australia. First established in the late 1980s, this contemporary Australian native foods industry has steadily grown from a small niche market to an industry that currently holds a retail market value of about \$80 million, with projections estimating that this value could be doubled by 2025⁽¹⁰⁾. This growth is largely due to increasing consumer interest in Australian native plant-derived products that are sustainably grown, highly nutritious and contain beneficial functional properties such as a high antioxidant content. As awareness within the wider population grows, both domestically and abroad, the traditional foods (hereinafter, this term refers to the traditional foods of the various First Peoples of Australia, unless otherwise stated) and medicinal plants that have a long history of use by First Peoples across Australia are increasingly being sought after⁽⁴⁾. Altogether, this increased interest is providing new avenues of growth for the native foods and botanicals industry, which is expanding to now encompass both domestic and international markets, as well as involving other commercial sectors such as tourism⁽¹¹⁾.

Although robust frameworks exist for the safety evaluation of foods and ingredients of commonly consumed foods, frameworks to evaluate the dietary safety of traditional foods are lacking. As the popularity of these traditional food items continues to grow, food regulatory authorities are raising concerns as to whether these foods are safe for consumption within the general population. However, with no clear pathway for market access, First Peoples who are attempting to establish their position within the native foods industry are facing barriers that are imposed by the current food regulatory requirements. These issues also extend to the requirements of food regulatory authorities globally, when assessing food safety and the market eligibility of traditional food items that originate from Australia.

This review examines the suitability of current food regulatory policy and the associated frameworks that are used to direct the dietary safety assessment of traditional foods entering Australian markets. The food-safety regulatory hurdles that are currently felt by the First Peoples of Australia who are attempting to enter the Australian native foods industry are also highlighted. Potential solutions to these problems are discussed,

including proposed regulatory changes that would allow the dietary risk assessment of traditional foods to be completed in a manner that better accommodates the stories, traditional knowledge (TK) and interests of Indigenous peoples who wish to market their traditional products within Australia, while also meeting the safety data requirements set out by regulatory bodies both within Australia and around the world.

Issues faced by First Peoples attempting to access the Australian native foods industry

Throughout its development, the Australian native foods industry has relied heavily on the traditional foods of the various First Peoples found across the continent of Australia for its commercial success, which has been made evident in industry-funded market studies that name certain plant species as ‘priority species of the industry’^(10,12) – all of which have a long history of traditional use by various First Peoples communities (see [Table 1](#)).

Today, as the industry continues to develop, there is increasing interest in First Peoples knowledge of the native flora, including traditional ecological knowledge that is leading to the mainstream discovery and identification of a broader range of plant species with particularly desirable characteristics and properties, such as unique flavours and beneficial nutritional aspects⁽⁶⁾. However, while the industry is heavily reliant on First Peoples knowledge there is little representation of First Peoples or their communities within the industry. As noted in an industry report that was developed for the Australian Government Department of Agriculture and Water Resources titled ‘The Native Foods Export Roadmap’, only a fraction of surveyed industry stakeholders reported being of First Peoples heritage⁽¹³⁾. The underrepresentation of First Peoples at every stage of the value chain was further highlighted in local media outlets, which reported that only 1% of industry revenue was actually returned to First Peoples and their communities⁽¹⁴⁾. Furthermore, it was also identified at the Indigenous Native Foods Symposium ‘that in 2019, Indigenous Australians represent fewer than 2% of the providers across the supply chain’ and ‘that nearly 98% of Aboriginal land owners aspire to be leaders in the native food industry’⁽¹⁵⁾. While capacity is building within the First Peoples communities, and a number of First Peoples-led businesses and enterprises are being developed, the relatively low rate of Indigenous business ownership is largely due to past practices such as economic discrimination⁽¹⁶⁾. It is not inconceivable to attribute this historical lack of First Peoples representation in the native foods industry, and more widely in the local economies of Australia⁽¹⁶⁾, to past colonial practices that have led to the theft of resource-rich lands from First Peoples⁽¹⁷⁾, economic marginalisation through wage theft and exclusion⁽¹⁸⁾ and low inter-generational wealth transfer within First Peoples families due to practices such as the institutionalised removal of children⁽¹⁹⁾.

Table 1. Compilation of Australian native foods that have been viewed as 'traditional' by the Advisory Committee on Novel Foods (ACNF)

| Native species | Traditional use as food product | Commercial use as food product | Views formed by the ACNF ⁽³⁴⁾ | Comments |
|---|---|--|---|--|
| <i>Akudjera or bush tomato*</i> (<i>Solanum centrale</i>) | Fruits eaten fresh or dried. Dehydrated fruit could be stored ⁽²⁾ | Fruits sold as freeze-dried flavour enhancer | Tradition of use as a food in Australia and New Zealand | Unripe fruit contains high levels of the solanine and should not be consumed |
| <i>Anise myrtle*</i> (<i>Backhousia anisata</i>) | | Leaves used for steeping, as a flavour enhancer or in essential oils ⁽²⁾ | Tradition of use as a food in Australia and New Zealand | Leaves used in tonic to provide vitalising effect ⁽⁵³⁾ |
| <i>Davidson plum*</i> (<i>Davidsonia spp.</i>) | Fruit eaten ⁽⁵⁴⁾ | Fruit and fruit pulp used in preserves and jams ⁽⁵⁵⁾ | Tradition of use as a food, mainly in Australia | Leaves and fruits have irritant hairs ⁽²⁾ |
| <i>Desert limes*</i> (<i>Citrus glauca</i>) | Fruit eaten ⁽⁵⁴⁾ | Fruit and fruit pulp used as a flavour enhancer ⁽⁵⁴⁾ | Tradition of use as a food in Australia | |
| <i>Green tree ants</i> (<i>Oecophylla smaragdina</i>) | As a flavour enhancer, imparting a lemon flavour ⁽²⁾ | As a flavour enhancer | Tradition of use as a traditional food in Australia. The Committee noted that there are reports of allergy, including three reports of anaphylaxis, associated with consumption of green tree ants | Reports of ants being crushed and used as a decongestant ⁽²⁾ |
| <i>Illawarra plum</i> (<i>Podocarpus elatus</i>) | Fruit eaten ⁽⁵⁴⁾ | Fruit and fruit pulp used in preserves and jams ⁽⁵⁴⁾ | Tradition of use as a food in Australia | |
| <i>Gubinge or Kakadu plum*</i> (<i>Terminalia ferdinandiana</i>) | Fruit eaten ⁽²⁾ | Fruits, fruit pulp and freeze-dried fruits ⁽⁵³⁾ | Long history of use in Australia | Very high ascorbic acid levels; reportedly highest content of vitamin C in the world. Infusion made from bark to treat sores (leprosy) or to alleviate aches and pains ⁽²⁾ |
| <i>Kangaroo grass</i> (<i>Themeda triandra</i>) | Seeds ground into flour to make dough for baking ⁽²⁾ | As per traditional use | Tradition of use as a food in Australia by First people | |
| <i>Lemon aspen fruit*</i> (<i>Acronychia acidula</i>) | Fruit eaten ⁽⁵⁴⁾ | Fruit and fruit pulp as a flavour enhancer ⁽⁵³⁾ | Tradition of use as a food in Australia | |
| <i>Lemon myrtle*</i> (<i>Backhousia citriodora</i>) | | Leaves used for steeping, as a flavour enhancer or in essential oils ⁽⁵³⁾ | Tradition of use in a number of food applications and appears to have been available (in this context) in Australia for several years | |



| | | | | |
|---|--|---|---|---|
| <i>Mintbush</i> (including <i>Prostanthera striatiflora</i>) | | Leaves used as a flavour enhancer ⁽⁵³⁾ | Tradition of use as a food in Australia | For streaked mint bush (<i>Prostanthera striatiflora</i>): leaves dried and crushed; powder added to water hole to stun drinking birds. Leaves steeped and used as medicinal wash ⁽²⁾ |
| <i>Muntries*</i> (<i>Kunzea pomifera</i>) | Fruit eaten. Dehydrated fruit could be stored ⁽⁵⁴⁾ | Fruit and fruit pulp as a flavour enhancer ⁽⁵³⁾ | History of use in Australia | |
| <i>Quandong fruit flesh*</i> (<i>Santalum acuminatum</i>) | Fruit eaten and oil extracted for cosmetic purposes. Dehydrated fruit could be stored ⁽²⁾ | Fruit and fruit pulp as a flavour enhancer ⁽⁵³⁾ | Traditional food in Australia | Paste made from fruit to treat sores. Bark used to alleviate itching. Decoction of bark and leaves used as a purgative. Infusion of roots used to alleviate rheumatism. Leaves burnt as mosquito repellent ⁽²⁾ |
| <i>Riberry*</i> (<i>Syzygium luehmannii</i>) | Pulp of fruit eaten ⁽⁵⁴⁾ | Fruit and fruit pulp as a flavour enhancer ⁽⁵³⁾ | Tradition of use as a food in Australia | |
| <i>River mint</i> (<i>Mentha australis</i>) | Adds flavour to cooked foods ⁽⁵⁵⁾ | As a substitute for common mint | Tradition of use as a food in Australia | Leaves crushed and inhaled for coughs and colds ⁽⁵⁵⁾ |
| <i>Round lime*</i> (<i>Citrus australis</i>) | Fruit eaten ⁽⁵⁴⁾ | Fruit and fruit pulp as a flavour enhancer ⁽⁵⁴⁾ | Tradition of use as a food in Australia | |
| <i>Saltbush</i> (<i>Atriplex nummularia</i>) | Seeds ground into starch to make dough for baking ⁽²⁾ | Leaves as a flavour enhancer ⁽⁵⁴⁾ | Tradition of use as a food in Australia | |
| <i>Sea parsley</i> (<i>Apium prostratum</i>) | | Leaves as a flavour enhancer ⁽⁵⁴⁾ | Traditional food in Australia | |
| <i>Tasmanian pepper*</i> (<i>Tasmania lanceolata</i>) | | Leaves as a flavour enhancer; berries used as a pungent spice ⁽⁵³⁾ | Traditional food (Australian native food) | |
| <i>Wattle seed*</i> (<i>Acacia spp.</i>) | Seeds ground into starch to make dough for baking ⁽²⁾ | As per traditional use | Tradition of use in Australia, including traditional use by First Peoples. Appears to have been available (in food context) in Australia for several years. | |
| <i>Murnong or yam daisy</i> (<i>Microseris lanceolata</i>) | Tubers roasted or eaten raw ⁽²⁾ | | Tradition of use as a food in Australia by First people | |

Their traditional and modern uses are listed (those previously deemed a priority by the industry are asterisked⁽¹⁰⁾).



Socio-economic barriers aside, the idea that traditional plants could be viewed as a mere commodity goes against the cultural beliefs held by many First Peoples. For various clan groups, many of these native plants have been so embedded into culture that they feature heavily in their creation beliefs and the dreaming stories that have been used for centuries to transmit their oral traditions. Many First Peoples also have cultural responsibilities, which in many cases are birthrights. These can include caring for native plants and the associated lore that may be a part of their kinship group and/or their cultural totems⁽²⁰⁾. Furthermore, First Peoples have a strong connection to 'Country', which extends on the settler's sense of the word that describes a geographical area. Instead, Country for First Peoples is strongly linked to an idea of self-identity, including creation beliefs and the origins of the natural world. This connection to Country also ties a person to cultural obligations, which includes caring for Country and the resources that come with the inheritance of their ancestral lands⁽²¹⁾. As such, this has resulted in First Peoples considering themselves the sovereigns and custodians of many of the native plants that grow on the Australian continent. This not only includes commercially viable fruit, but also the complete plant and its products (seeds, fruit and other plant material), as well as the traditional and cultural knowledge associated with the plant resources⁽²²⁾. This way of being both culturally and spiritually connected to the natural environment is rarely understood or considered by those looking to commercialise native plant products. This often results in First Peoples feeling a sense of being both disrespected and dispossessed, and also being offended by those who wish to exploit their culture and Country for commercial gain⁽²³⁾.

The current Australian legal system offers little opportunity to prevent the commercial exploitation of First Peoples' traditional or cultural knowledge, including that which pertains to knowledge of traditional plants⁽²⁴⁾. Within Australia, intellectual property laws demand documented evidence, can only be applied to prescribed individuals and only last for a defined period of time⁽²³⁾. These concepts completely disregard and are at conflict with First Peoples' culture where TK is conveyed orally through history, and is held collectively and in perpetuity^(23,25). Furthermore, under Australian law those entrepreneurs who utilise TK in the creation of commercial products are currently not required to enter into access and benefit-sharing agreements, nor are they required to pay regard to the interests of First Peoples^(23,24). This lack of access and benefit-sharing is at odds with the Nagoya protocol, for which Australia signed onto in 2012, but is yet to ratify the agreement⁽²⁶⁾.

This lack of protection offered to First Peoples and their culture is in conflict with the UN Declaration on the Rights of Indigenous Peoples (UNDRIP), which states that 'Indigenous peoples have the right to maintain, control, protect and develop their cultural heritage, traditional knowledge, and traditional cultural expressions'⁽²⁷⁾. According to UNDRIP, this right extends to their 'knowledge of the properties of fauna and flora' and that Indigenous people 'have the right to maintain,

control, protect and develop their intellectual property over such cultural heritage, traditional knowledge, and traditional cultural expressions'⁽²⁷⁾. UNDRIP was first adopted by the General Assembly in 2007, by a majority of 144 states in favour and four votes against⁽²⁸⁾. Notably, the four member states that initially voted against the declaration were Australia, Canada, New Zealand and the United States, however Australia later endorsed UNDRIP in 2009⁽²⁸⁾.

While there are cultural obligations held by First Peoples across the continent and many feel that they need to protect their culture and knowledge to prevent further exploitation, the increasing market demand for native food products is presenting an opportunity for First Peoples to take back control of their traditional foods and benefit economically from their commercialisation. In an attempt to ensure First Peoples' culture and interests are held in regard, there has been an emergence of First Peoples' owned and operated businesses, social enterprises and First Peoples land councils and Traditional-Owner corporations that are striving to be industry leaders. These aspirations of self-determination are being further supported by a recently formed First Peoples-led native foods and botanicals industry representative body, which aims to improve First Peoples involvement in the industry⁽¹⁵⁾.

While it is apparent that the native flora and fauna found on the Australian continent has sustained the various First Peoples of Australia for up to 65 000 years⁽²⁹⁾, most of the TK and practices that ensured the correct use of these foods have rarely, if ever, been recorded in writing, but instead these extensive knowledge systems have been passed on through cultural practices and language⁽²²⁾. Furthermore, while several studies have reported on the nutritional properties provided by various native foods, detailed assessments of the dietary safety of these foods are currently lacking. This way of passing on knowledge and history through time, coupled with the lack of safety data, is presenting some challenges for First Peoples and their businesses when attempting to demonstrate consumer safety based on a history of safe use to meet both domestic and international food-safety regulatory requirements.

Within Australia and across many developed jurisdictions, the current food-safety regulatory frameworks that are used to direct a risk assessment of traditional food items do not have the capacity to recognise the TK held by Indigenous cultures of the world. Instead, and as explored in more detail later, they are largely based on Eurocentric viewpoints that expect history to have been transcribed and documented through time. This way of thinking completely disregards the practices of non-Western cultures and pays little regard to the impact that colonialism and imperialism has had on Indigenous cultures, such as those of the First Peoples of Australia. This is making it extremely difficult for First Peoples and their businesses to successfully utilise their long history of use in the development of their traditional food products. Ultimately, this is presenting a regulatory hurdle that is resulting in missed opportunities that could otherwise see First Peoples take advantage of the

booming native foods industry and benefit economically from the commercialisation of their traditional food products in a manner that utilises their culture, TK and resources^(8,23).

Regulation of traditional and novel foods in Australia and New Zealand

Australia has grown a reputation as being a modern, safe, reliable and sustainable producer of food. Today, over 90 % of all fresh fruit and vegetables, meat, milk and eggs sold in supermarkets around the country are domestically produced and over half of the country's agricultural produce is exported to international markets, accounting for about 20 % of the total domestic manufacturing sales and serviceable income. This makes the food industry an integral part of Australia's economy⁽³⁰⁾.

To ensure that Australia maintains this reputation, Australia and New Zealand have developed a joint system to oversee policy and laws related to food. This system is responsible for setting food policy, making food standards and the implementation and enforcement of food regulations. Within this system, Food Standards Australia New Zealand (FSANZ) has been established as an independent statutory agency to develop regulatory requirements set by the Australian and New Zealand governments in the Australia New Zealand Food Standards Code (the Code)⁽³¹⁾. This Code is comprised of a variety of standards that oversee the use of ingredients, processing aids, food additives, novel foods, vitamins and minerals⁽³¹⁾.

The Code (in Paragraphs 1.1.1-10(5)(b) and (6)(f)) states that a food for sale must not consist of, or have as an ingredient or a component, a novel food. Novel foods are non-traditional foods that require assessment by FSANZ in order to establish their safety before they are added to the food supply⁽³²⁾. Novel foods and novel food ingredients are regulated under Standard 1.5.1 – Novel Foods within the Code⁽³³⁾.

With regards to the native and traditional food sector, applicants who wish to sell their native or traditional food will need to consider whether it meets the definition of a novel food under Standard 1.5.1 of the Code, and therefore whether pre-market regulatory approval is first required. Standard 1.5.1 includes definitions for a novel food and a non-traditional food⁽³³⁾, with a non-traditional food being defined as:

- (a) a food that does not have a history of human consumption in Australia or New Zealand; or
- (b) a substance derived from a food, where that substance does not have a history of human consumption in Australia or New Zealand other than as a component of that food; or
- (c) any other substance, where that substance, or the source from which it is derived, does not have a history of human consumption as a food in Australia or New Zealand.

A novel food is described in Standard 1.5.1⁽³³⁾ as a non-traditional food that requires an assessment of the public health and safety considerations having regard to:

- (a) the potential for adverse effects on human subjects; or
- (b) the composition or structure of the food; or
- (c) the process by which the food has been prepared; or
- (d) the source from which it is derived; or
- (e) patterns and levels of consumption of the food; or
- (f) any other relevant matters.

The responsibility for determining whether a food item is novel falls on the supplier or manufacturer who must determine whether the food is traditional or non-traditional and whether it requires a safety assessment based on the considerations listed earlier. To assist suppliers or manufacturers in making this determination, the Advisory Committee on Novel Foods was established to provide a non-legally binding opinion on whether a food item would meet the definition as being novel according to Standard 1.5.1⁽³⁴⁾.

If a supplier or manufacturer considers a food to be non-traditional it may meet the definition of a 'novel food', as outlined in Standard 1.5.1. If this is the case, the supplier or manufacturer can make an application to FSANZ to approve the use of a new novel food or novel food ingredient, and a pre-market assessment to determine public health and safety considerations is then undertaken. This process includes a detailed assessment of the relevant safety aspects of the food or food substance. It may include information on specific preparation processes (such as cooking, fermenting, etc.), identification of the source from which the food is derived, patterns and levels of intended consumption, as well as historical information that may highlight a history of use and/or any known adverse effects. Compositional studies would also be required to understand whether the food item contains any known chemical classes of concern and to what extent. Depending on the food or ingredient, *in vitro* genotoxicity assays and a 90 d sub-chronic dietary study in rodents may also be required. Additional studies, such as developmental and reproductive studies in rodents may also be required⁽³⁵⁾, which adds a substantial amount of time and cost to the assessment procedure.

While the aforementioned process outlines the regulatory requirements for amending the Code in order to add a new food item to the Novel Foods Code, a food supplier wishing to sell a traditional food item to commercial markets within Australia and New Zealand is not required to go through the Novel Foods application process⁽³⁵⁾. Instead, a food supplier can self-determine whether they believe their food item is traditional or not. In this situation, a food business supplying a traditional food would be expected to hold basic information to support consumer safety. However, due to the severe paucity of safety data within the literature and because many traditional foods have not previously been sold on commercial markets, First Peoples wishing to prepare their traditional food items for the market would be expected to generate this safety data on their own accord. As outlined earlier, successfully generating sufficient safety data to ensure consumer safety with any confidence is both a costly and time-consuming process.

This process may not be possible for many small businesses that would like to develop their traditional foods for commercial markets.

International regulation of traditional foods

The requirements in the Australian and New Zealand Food Standards Code are comparable to overseas food regulations. The International Program on Chemical Safety (IPCS) harmonisation guidelines have been developed by the FAO of the UN and the WHO, to provide member countries with a globally harmonised approach to the risk assessment of novel and traditional foods⁽³⁶⁾. These IPCS guidelines (in Chapter 9) deem a food to be 'traditional' if it has an extensive history of use by a country's ethnic population⁽³⁶⁾. It also states that a history of use may be coupled with anecdotal information on how it is prepared, how it is eaten and whether the food in question has any particular claims attributed to its use⁽³⁶⁾.

Therefore, under these guidelines the extensive use of native Australian foods by First Peoples would result in many of these foods being deemed as traditional within Australia. However, this classification of a food item as traditional only implies a 'history of use'; it does not imply that the food is also safe for general consumption. To establish that a food item is indeed safe for general consumption, further evidence is needed that indicates a 'history of safe use', as opposed to a 'history of use'. The IPCS guidelines state that a qualified presumption of safety needs to be established, whereby 'there is evidence for the safety of the food from compositional data and from experience since the food has been an ongoing part of the diet for a number of generations in a large, genetically diverse population'⁽³⁶⁾.

Based on the definitions provided by FAO/WHO, the majority of Australian native foods would be considered traditional for their long history of use by First Peoples, and therefore should be assessed as such, and a general history of use can be established. In terms of successfully establishing a history of safe use under the definitions provided in the IPCS guidelines, the main shortfall is in the lack of compositional data that would otherwise provide greater certainty about consumer safety. It is also worth noting that work currently being undertaken by the National Centre for Indigenous Genomics in Australia suggests that there is substantial genetic diversity between the different First Peoples communities found across the Australian continent⁽³⁷⁾. If it is shown that there is substantial genomic variation between different clan groups, then many commonly consumed traditional foods would have also been consumed by a large, genetically diverse population, which is the second requirement for determining a history of safe use, as stated within the IPCS guidelines⁽³⁶⁾. This understanding coupled with generated compositional data would mean that not only a 'history of use' but also a 'history of safe use' could be established for many of the traditional foods that are found across the Australian continent.

Policy implications and proposing potential regulatory solutions

From here on the authors provide and discuss new processes that may be used when assessing the safety of traditional food items that are to be marketed within Australia and New Zealand, with the aim of providing ideas that may see the regulatory procedure become culturally safe and appropriate for traditional cultures wishing to develop their traditional foods for today's markets.

It is worth noting that New Zealand and Australia share a food regulatory agency in FSANZ, and as such, the Māori of Aotearoa/New Zealand are under the same regulatory conditions of the previously highlighted Novel Foods Standard. However, the First Peoples of Australia and the Māori of Aotearoa/New Zealand, even though sharing a food regulatory agency, are culturally diverse and have unique and differing political standing within their respective countries. Nonetheless, it is hoped that the following proposed changes will ignite discussions about how these shared regulatory frameworks can better respect traditional cultures from around the globe and their respective traditional foods.

Policy implications: the acknowledgement of First Peoples' food expertise in the risk assessment of traditional foods

For many of the traditional food products that are today being considered for their commercial viability within Australia, the long history of use by First Peoples has not been documented in written form. This includes important aspects that are needed to determine whether a safe history of use can be established, such as harvesting and preparation techniques, as well as consumption patterns. Instead, this practical knowledge has been developed over many millennia and passed on from generation-to-generation through cultural practices and language.

The current frameworks for assessing the safety of traditional foods have limited capacity to assess those traditional foods that are not supported by written documented evidence. Instead, they may treat unsupported traditional foods as non-traditional foods, even if there is a long oral history of use within traditional communities. This is creating some uncertainty amongst First Peoples and their businesses who are attempting to navigate the regulatory pathway for their traditional food items. Overall, the lack of recognition of First Peoples' history of use, including the TK held by First Peoples, is hampering market access, and subsequently slowing the growth of the Australian native foods industry.

The authors do not propose that simply recognising TK (documented in written or oral form) will be indicative of widespread consumer safety, instead it is suggested that the submission of TK, in whatever form it may exist, should be considered in, and add weight to, the overall risk assessment. The proposed changes that would see the regulatory process become adaptable to

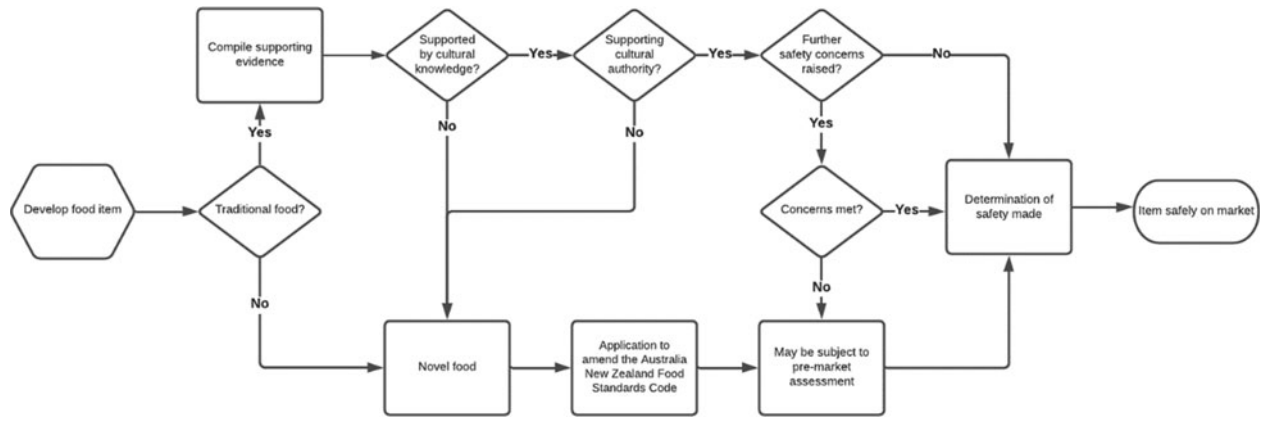


Fig. 1. Proposed processes that can be utilised within Australia to better assess the dietary safety of traditional foods. The proposed changes consider the unique culture and histories held by First People, including their long history of use with many of the native plant foods that are today being developed for commercial markets. The proposed changes offer an opportunity to legitimise the supplied traditional knowledge via a requirement for cultural authority and also provide an opportunity for a food-safety regulatory assessor to give opinions as to whether the food item requires further safety testing. Greater detail for each step is provided in Table 2.

the lived experience of traditional cultures are outlined in Fig. 1 and further detailed in Table 2, with the goal being to reduce the burden on companies wishing to develop certain traditional food items that already have a long history of use within traditional communities.

Adaptation of the food regulatory process can be achieved by recognising the TK and plant expertise, including harvesting, preparation techniques and consumption patterns, in the early stages of the risk assessment. Once a history of use has been established based on traditional use and practices, then there is an opportunity for the supplier to be notified of any further safety data that may need to be generated to ensure consumer safety in the general population. This ensures that evidence requirements for identifying the safety of certain food items is proportionate to the risks they may pose. Overall, the proposed approach does not differ greatly from the current regulatory pathway. However, successfully recognising the means by which First Peoples have transcribed history, including their practical skills towards the use of their traditional plants, would provide a regulatory pathway that is culturally safe and appropriate for traditional cultures, including the First Peoples of Australia who are attempting to navigate Eurocentric frameworks that expect history to have been transcribed in written text.

It is also important that any TK provided is critiqued for its authenticity and legitimacy to ensure that such knowledge is founded on actual real-world experience. To achieve this, it is suggested that any claim about TK must be supported by cultural authority and weighted accordingly; this is explored in greater detail later. If either the supplier fails to provide adequate TK that indicates a safe history of use for their food item or is unable to substantiate the provided knowledge with appropriate cultural authority, then a request for a more comprehensive pre-market assessment would be warranted and the food item may be assessed as being a novel food.

After considering the TK and verifying the cultural authority of that knowledge, the proposed process then provides an opportunity for further concerns to be raised by a food-safety regulatory assessor. This takes the onus away from the food supplier which, in the case of traditional food suppliers (or any small food business), are unlikely to have the in-house expertise or capacity to evaluate and ensure consumer safety within the general population. Instead, this process grants an opportunity for a food-safety regulatory assessor to consider the application and make an informed decision as to whether they believe there is any indication that the food item may not be safe for consumption within the general population. This also offers an opportunity for specific concerns to be raised, such as the potential for allergenicity. In such a scenario, the supplier would then be expected to have the appropriate test(s) performed, rather than initially needing the food to be subjected to a comprehensive pre-market assessment, as would be the case if it was deemed to be novel food by the current system. The goal should be that the regulatory requirements are proportionate to the risk that may be posed. As an example, along with the TK that indicates a history of use and the accompanying cultural authority legitimising the claim of traditional use, it might be recommended that a supplier who is looking to develop a traditional nut for the market should obtain both compositional and allergenicity data. This is an example of a request that is fit-for-purpose and appropriate, where TK is included in the safety considerations along with the appropriate safety data that one might also expect for addressing common concerns when assessing the safety of an edible nut.

In a situation where further safety studies are warranted because the TK provided by the supplier is patchy or unclear, this recognition of TK in the early stages would still provide valuable information that may improve consumer safety. This could include information that may allude to best practice in terms of the food's safe



Table 2. Detailed explanation of the steps in the process* shown in Fig. 1

| Step | Overview | Definition |
|----------------------------------|--|--|
| Traditional food? | This is asking the food supplier if they believe the food should be viewed as a 'traditional food'. If so, then it must meet the definition of a traditional food. If not, then the food will be viewed as being novel. | The International Programme on Chemical Safety deem a food to be 'traditional' if it has an extensive history of use by a country's ethnic population ⁽³⁴⁾ . |
| Compile supporting evidence | The next step in the process is to begin compiling the evidence that shows the food is traditional and that it has a history of safe use. | This can come in many forms, including written documented evidence, or transcribed oral histories. |
| Supported by cultural knowledge? | This is asking the food supplier to provide evidence that the traditional food has been used safely within traditional communities and to what extent. Ultimately, this is asking the food supplier to highlight a history of human consumption within traditional cultures, including the associated traditional knowledge. | Supporting cultural and traditional knowledge may include information about First Peoples expertise that relates to the safe use of the traditional food item including harvesting, preparation and processing techniques, especially those that reduce the severity of any risk. It is also important to highlight consumption patterns, including length of use, frequency and quantity of consumption, and if any known adverse effects are associated with the consumption of the food item. |
| Supporting cultural authority? | Along with the claim of traditional use, the food supplier must be able to support their claim with adequate cultural authority. This ensures that the supplied cultural knowledge (that is suggestive of the traditional and cultural use) is legitimate and founded on actual traditional practiced methods. At this point the appropriate party would examine the supplied evidence including the traditional knowledge and the cultural authority. Based on the evidence supplied and the nature of the food item, there may be a request that further information be provided to strengthen the enquiry. It may also be requested that specific supporting data be generated or supplied. If all conditions are adequately met, then the enquiry will be processed, and a determination of safety will be made. | Cultural authority would ideally come from a prescribed body corporate, a Traditional-Owner corporation, or another suitable cultural authority. This claim will be weighted based on the level of cultural authority obtained. For example, an affidavit from a prescribed body corporate, that includes well-documented accounts of the way the food is used and how they know that the food has this history, would be highly weighted. The assessor in this situation could be a First Peoples advisory board that critiques the validity of the claims. |
| Further safety concerns raised? | This is the first hurdle in the application procedure that will only be reached if the previous checks have been met (i.e. supporting traditional knowledge has been supplied and cultural authority has been recognised). Based on the evidence supplied and the nature of the food item, it may be requested that further information be supplied to strengthen the enquiry. Additionally, it is an opportunity for the assessor to raise any safety concerns that may be specific to the food item being assessed. If all conditions are adequately met, then the enquiry will be processed, and a determination of safety will be made. | The assessor for this stage should be a food-safety regulator who has knowledge about public safety. Specific toxicological and nutritional issues may be raised based on the nature of the food item, including its chemical composition and how much of the food item is intended to be consumed. This may depend on a multitude of factors that are specific to the particular food item, such as the plant species and/or the way that a final food product will be prepared and consumed. For example, further allergenicity testing may be required for food sources that come from known allergenic sources, such as a nut. |
| Concerns met? | If further safety concerns have been successfully met, then the enquiry will be processed, and a determination of safety will be made. | |
| Determination of safety made | At this point a decision would be made based the food item's potential to impact on public health and safety. | |

| | | |
|--|---|---|
| <p>Novel food (in the context of a non-traditional food)</p> | <p>If the food is deemed non-traditional or does not have a history of human consumption within Australia, then it may be assessed as a novel food. Novel foods require an assessment by Food Standards Australia New Zealand in order to establish their safety before they can enter the general food supply.</p> | <p>Foods that are deemed non-traditional are considered novel. A novel food is a food that does not have a history of human consumption in Australia or New Zealand. This includes substances that are derived from foods, where that substance alone does not have a history of human consumption in Australia or New Zealand, such as a plant food extract.</p> |
| <p>Application to amend the Australian and New Zealand Food Standards Code</p> | <p>Before a novel food can be sold or used as a food ingredient within Australia or New Zealand, an application to have the food listed in the Australia New Zealand Food Standards Code needs to be submitted. A novel food cannot be sold as food or used as a food ingredient unless it is listed in the Code.</p> | <p>Anyone wanting to sell a novel food, or a novel food ingredient must apply to Food Standards Australia New Zealand to request that the Code be amended to include the food or ingredient in the list.</p> |
| <p>May be subject to pre-market assessment</p> | <p>If none of the previous requirements can be met, then the traditional food item should require a pre-market assessment before it enters commercial markets.</p> | <p>The purpose of this assessment is to evaluate the food item's potential impact on public health and safety. This assessment considers a variety of toxicological and nutritional issues together with information about its chemical composition and how much is intended to be consumed. Under most circumstances, this would involve a detailed knowledge of the key constituents including those that could have an impact on safety, for example the presence of natural toxicants, anti-nutrients, and possible contaminants, including those that could be formed during processing.</p> |

* A food supplier wishing to market a traditional food item would need to make an enquiry to the national food regulatory body, Food Standards Australia New Zealand, and a determination of whether a food item could be assessed as traditional or not would be made.

use, as well as warnings about certain hazards that may be present within the whole plant product, thus providing valuable information that may otherwise be missed when performing a risk assessment on the isolated food component. This process needs to formally recognise orally recorded TK and the associated plant expertise held by First Peoples, which would also make the process accessible to Traditional Owners who do not use English as their first or subsequent language. Acknowledging this undocumented knowledge is particularly relevant because a vast array of Australian native plants have not only provided a source of food for First Peoples, but also feature heavily in their pharmacopeias⁽³⁸⁾. Without such safety information, the chance of harm increases for many of these plants should they be used incorrectly, and thereby they could pose a health risk to unwary consumers.

Weighting claims of First Peoples traditional knowledge

It is important to assess the quality of the TK provided by the suppliers of traditional foods, including First Peoples and their businesses, to provide a weighting to the validity of that knowledge. The authors suggest that an appropriate party for critiquing TK should be a First Peoples advisory group. FSANZ currently chairs the Advisory Committee on Novel Foods, which comprises experts on public health to provide advice on novel foods⁽³⁴⁾. A similar advisory group could be made up of First Peoples knowledge holders to provide advice on whether a food is traditional and whether the TK provided in the application has appropriate cultural authority. In fact, many First Peoples and their land councils or Traditional-Owner corporations already have cultural knowledge reference groups that could provide advice on TK pertaining to the use of traditional foods originating from their lands or waters. This idea of an advisory group is not a new concept, with many Australian Government departments currently implementing First Peoples advisory groups into their decision-making processes⁽³⁹⁻⁴²⁾.

Evaluating the weight of claims of the TK in the application provides an opportunity for an appropriately expert committee to critique the evidence given and ensures that both First Peoples and non-Indigenous suppliers are providing legitimate and substantiated TK. The authors suggest that this may be achieved by weighting the claim of TK based on the level of cultural authority that accompanies the claim. For example, a highly weighted submission might come from a TK reference group and/or a traditional community group, which are actively practicing these practical skills. This claim of cultural authority should come from the Traditional Owners from whom the plant food originates and have been, or are, traditionally using this food. In contrast, and as detailed in Table 2, a weak claim would have neither substantial backing nor a link back to Traditional Owners, and therefore would be lacking in cultural authority.

Weighting the TK based on cultural authority achieves three outcomes that both improve First Peoples right to



self-determination⁽²⁷⁾ and add to the overall integrity of the native foods industry. First, it ensures that the information provided by the supplier is verifiably true of nature and has been founded from actual lived experience practiced by First Peoples and is therefore legitimate TK. Secondly, where current Australian law offers little support in terms of the protection of TK, this requirement of legitimate TK that is backed by appropriate cultural authority sets up an opportunity for the fair and equitable sharing of benefits to be arranged between Traditional Owners (who authorise the TK) and the native food entrepreneurs (who wish to utilise the knowledge in their commercial endeavours). Put simply, businesses, whether owned by First Peoples or not, need to validate the TK they hope to use to support their claim of a history of (safe) use, and in order to achieve this, they need to seek an endorsement from the Traditional Owners. This endorsement needs to verify that what is being put forward as TK is founded on actual traditional practices. This then grants an opportunity for Traditional Owners to take control of how their knowledge is utilised, which opens an opportunity for Traditional Owners to set terms on how their knowledge is utilised in commercial endeavours. This may include the establishment of access and benefit sharing agreements, which would be in line with the aforementioned Nagoya protocol⁽⁴³⁾, or community capacity-building opportunities that sees First Peoples becoming directly involved in the operations that support the commercial endeavour. This leads to the third and perhaps most important outcome, that being an opportunity for Traditional Owners to choose not to share their TK should they not want to see their cultural intellectual property utilised in commercial endeavours, such as the commercialisation of traditional food products. Ultimately, weighting the claim of TK should ensure that the supplier, be they owned and operated by First Peoples or not, have at least liaised with the Traditional Owners who are the bearers of the TK that, in many cases, has led to the commercial opportunity in the first place.

Recognising TK in the risk assessment process is not meant to preclude any entrepreneur, whether First Peoples operated or not, from developing a native food product. However, if the supplier is not able to provide TK that indicates that the food item has a history of traditional use or provide the accompanying cultural authority to substantiate that TK, then the food item should be viewed as non-traditional to Australia. Depending on whether an assessment of public and health considerations is considered necessary, the non-traditional food item should then be potentially viewed as a novel food item. As detailed earlier, if a food is considered novel, it will require an application to amend the Food Standards Code, for which FSANZ will undertake a pre-market assessment to determine safety⁽³⁵⁾. Compiling the dossier of evidence to support an application is a costly and time-consuming process, especially since applications often require *in vivo* dietary studies in experimental animals. Therefore, it is not hard to see that, where possible, working alongside Traditional Owners and having

the food item assessed as being a traditional food makes the most economic sense.

Building an evidence base about oral histories

As interest in the consumption of traditional plants grows, it is well understood that the complex knowledge systems held by First Peoples that have been developed over tens of millennia are the corner stone of Australia's native food industry. It is true that a lack of safety data or written documented evidence that details how these foods are used is making it difficult for native food entrepreneurs to prove a history of safe use under current regulatory frameworks. However, the lack of written documented evidence could present an opportunity for First Peoples as the bearers of the orally recorded TK to become industry leaders of a dispossessing native foods industry that was founded upon, and is now largely reliant on, their traditional and cultural knowledge for the discovery of the next marketable product.

As outlined earlier, the authors suggest that recognising the unique history and knowledge held by First Peoples of Australia in the risk assessment of traditional foods would provide greater knowledge about best practice in terms of the safe use of many foods that are being developed for commercial markets, while also greatly facilitating First Peoples involvement in the industry. However, in saying this, the authors acknowledge that in some cases there may not be enough evidence provided by the TK to determine consumer safety. This is especially true for foods that originate from plants that belong to a plant genus of concern, such as the nightshade (*Solanaceae*) family that often contain toxic levels of alkaloids at various times of growth⁽⁴⁴⁾, or edible tree nuts that are commonly known to invoke allergies in susceptible populations⁽⁴⁵⁾. In these cases, building a more rigorous evidence base that includes the generation of safety data and compositional studies may be the most appropriate means to determine consumer safety within the wider population.

In order to successfully achieve this, the authors suggest that there is an opportunity for First Peoples to work directly with academia and food regulators to begin generating safety data within a laboratory setting that would complement the practical skills held by traditional communities. In such cases, researchers and food regulators need to ensure they are incorporating sound principles of responsible research and innovation along with established co-design practices⁽⁴⁶⁻⁴⁸⁾, which see First Peoples as co-researchers rather than participants⁽⁴⁹⁾. Successfully incorporating these co-design practices into the research design should not only lead to a culturally safe research project⁽⁵⁰⁾, but should also provide a means for First Peoples to achieve greater self-determination through the research outcomes.

The extent of safety data that would need to be generated could be based on an already-used concept in the regulation of GM foods known as substantial equivalence, whereby the GM food is compared both toxicologically and nutritionally to a similar food item that is already commonly consumed by the public⁽⁵¹⁾. The



authors propose that the same could be achieved by comparing a traditional food to a commonly consumed comparator, such as comparing a native grain variety to commonly consumed wheat grain. The outcomes of these results would then determine the extent of further safety testing that is warranted. First Peoples and academia would also need to work together to understand whether the marketable use of the traditional food differs from that which was used in traditional settings (e.g. a whole food *v.* an extract) and whether the dietary intakes and/or exposure levels will be the same. This information comes straight from the TK held by First Peoples and, from a regulatory viewpoint, should also be substantiated by cultural authority (as outlined earlier). Where this information cannot be supplied by the Traditional Owners, then the compositional data generated would provide important information to assess whether the proposed intake levels would be safe, based on their substantial equivalence. Again, by utilising substantial equivalence, the traditional food could be compared directly against a commonly consumed food in a range of *in vitro* bioassays to assess toxicity biomarkers and to also monitor allergenicity and immune responses. The outcomes of the aforementioned studies would then provide insight as to whether further *in vivo* animal studies would be warranted. Ultimately, building such a scientific evidence base that complements the TK for that food item should satisfy regulatory requirements, both domestically and internationally.

Conclusions

As outlined throughout, there are many factors that contribute to ensuring that consumers have access to safe and nutritious food. Consequently, as a larger range of traditional foods are developed for commercial markets, further work is needed to not only promote the safe use of Australian native foods within the wider community, but to also work alongside Traditional Owners to gain a greater understanding of how these foods have been successfully used in the past. In achieving this, there is an opportunity for the TK developed by the longest living continuous culture⁽⁵²⁾ to complement the food-safety science that is needed to identify potential risks which may be associated with the consumption of various native food items. However, before this is possible, the regulatory procedures that aim to assess the safety of traditional foods and critique the history of how these foods have been used in the past, also need to have the capacity to accommodate the fact that First Peoples have been using native Australian plants as a source of food for at least 65 000 years⁽²⁹⁾. Ultimately, if consumers and governments have a high level of confidence in the safety of native foods, then the industry should continue to grow both domestically and around the world.

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Conflict of Interest

None.

Authorship

L. B. W. wrote the manuscript. P. F. A. W. provided consultation and support to L. B. W. and provided editing support throughout the writing process. M. J. provided cultural support and knowledge to L. B. W. and provided editing support on the final manuscript.

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