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Qualitative assessment of value in Australian pork across cultures

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Abstract

Context. The Australian pork industry would benefit greatly from further development of export markets across Asia, but due to the small size of the Australian industry and cultural differences between Asia and the West, further insight research is required for premium product development.

Aims. Qualitatively assess value in Australian pork across Australian and Chinese consumer groups to investigate perceived differences in cultural attitudes to pork.

Methods. Qualitative multivariate analysis (QMA).

Key results. Australian and Chinese opinions of Australian pork products, meat and offal, and farming systems differed significantly. Australian consumers desired expert opinion, traditional meat cuts with minimal packaging, and small-scale production with superior animal welfare. Chinese consumers wanted clean, healthy and versatile products, with consistent quality, without concerns around animal welfare.

Conclusions. The compatibility of the markets and consumer preferences show great promise for Australian pork holding value in the eyes of Chinese consumers,

Implications. Results offer insight for future product development for export and targeted domestic markets. Findings will also enable future quantitative research efforts to be more targeted and specific.

Introduction

The Australian agricultural sector has been experiencing a price boom over the last several years due to the development of its market access and increasing demand for high value foods across Asia (Bittner *et al.* 2017). However, this impact has not been felt equally across all industries within the sector. While Australian pork was initially expecting to see growth related to these trends, three buoyant years ended with an unexpected market crash in 2018, with low domestic prices and exorbitant production costs sending the industry into crisis (Lee 2018). Currently, with African Swine Fever (ASF) ravaging the Asian continent and decimating pig populations all over the Pacific (MLA, 2019), pork prices in Australia have increased while the continent remains ASF free. This market stabilization due to ASF should not be seen as a sustainable avenue for the growth of Australian pork, and the industry must use this time to invest in more stable, long-term avenues for its future. COVID-19 has also had an impact on the Australian pork market with meat being an item that was stockpiled during lockdown stages (D'Souza and Dunshea 2021). The global pandemic and lockdowns initially caused a

surplus of pork due to interruption and closure of restaurants and food service, particularly in premium cuts, although this was buffered by the increased household demand, and has since rebounded since most Australian lockdowns have been removed (D'Souza and Dunshea 2021).

Unlike Asia, where the entire carcass is consumed and sold with high margins, with offal and ribs narrowly representing the largest consumption as part of a very even distribution (Oh and See 2012), Australian consumers are far more selective in the cuts they desire. Large proportions of the pig carcass are sold at a low cost or even a loss due to them having little to no value in the domestic market. Add to this that currently Australian pork imports far exceed exports (APL 2017), and you have an incredibly vulnerable market to even small price fluctuations. The COVID-19 pandemic has had an even greater impact on Australian trade of pork with decline in air travel and increased freight costs reducing both the imports and exports (D'Souza and Dunshea 2021). Prior to these issues, producers felt that the global trade environment has shifted away from expectations since the government last addressed foreign policy, domestically operating as a free market with little to no tariffs on imports, while not seeing the benefits from its trade partners on exports (APL 2017). Innovation and expansion into export markets is required for the Australian pork industry to properly address these issues as the world begins to return to normal post COVID-19.

Discovering compatible international markets obviously makes economic sense for the Australian pork industry, but making better and more complete use of the entire carcass also has incredible environmental and social sustainability impacts at the same time. Chinese and Western pork preferences are extremely complimentary, with Western consumers preferring lean meat cuts, and Chinese consumers leaning toward fat cuts and pork offal (Wang *et al.* 1998). The comparative size of the Asian market makes it an obvious target for Australia with an ever-growing middle class and more affluent consumers than Australia's entire population (Euromonitor 2011). China, Japan, Korea, along with several niche markets in Hong Kong and countries within the ASEAN region are increasingly high value export market possibilities for Australian pork (APL 2010). The value of these Asian markets is also likely to be stable heading into the future with Asia set to become the backbone of global consumer markets, predicted to account for 50% of all global consumer expenditure by 2050, with strong growth in luxury goods and a rising trend of premiumisation (Euromonitor 2017).

The mere fact that the carcass disposal is compatible between Australia and these Asian nations does not mean it is simple to develop these markets as viable export options. Consumer, market and sensory research will be required to fully appreciate how Australian pork can be competitive in Asia (Bittner *et al.* 2017). Understanding the impact of cultural differences and their impact value is key to development of these export opportunities, as currently Australian pork is not highly valued in these markets. Due to this current lack of value, and the relatively small size of Australia's pork industry, it is important that Australia look to export quality over quantity (Bittner *et al.* 2017). While significant market opportunity does exist for exporting premium food products to Asia, internationally Australia are deemed as good sellers of food, but not good promoters on their exports, relying on their reputation as a 'clean and green' nation (Bittner *et al.* 2017). However, Australia is not the only country to hold this reputation, and more effort is needed to stand out in an ever-increasing marketplace. To gain proper market access in Asia, and China specifically, Australia must do

so in specific premium products catered to the luxury goods market. With Asia possessing over 2600 unique cultural consumer segments, and China alone being more culturally, linguistically, religiously and genetically diverse than the entire European Union (Euromonitor 2011), insight is required to capitalise on these opportunities. This is particularly true for Western nations where food eating habits, ingredients, preparation, and packaging are all vastly different.

While quantitative studies will be necessary to complete the full analysis, qualitative methodology is a key first step into asking the right questions to properly address what to test quantitatively, through methods such as conjoint analysis. Qualitative research is a quick, inexpensive way to probe consumer demands in a natural and comfortable setting allowing to properly develop and refine hypotheses in product development, leading to a better understanding of consumer behaviour and motivation (Jervis and Drake 2014; Hastie *et al.* 2020; Mena *et al.* 2020). This research will assess value in Australian pork across both domestic (Australia) and Asian (China) markets using qualitative methods. This project aims to investigate perceived differences in cultural attitudes to pork, through the use of Qualitative multivariate analysis (QMA). The study will explore how these cultural differences impact value and premiumness, and define the attitudes and opinions that drive value perception in both Australian and Chinese consumers.

Materials and Methods

Also known as napping, QMA is a method for sorting groups of things (e.g. products or packages) with reference to each other (e.g. similarities and differences) based on their qualities (Lopetcharat and Beckley 2012). It is a modern and reliable technique to perform research exploration that has historically found results with small sample size (n= 12) similar to those obtained in larger quantitative studies (n=110) (Drake *et al.* 2009).

A QMA deals with two variables, in this case, set by the researcher, both on a continuous scale with the extremes of each other in order to stretch the available space for mapping as far as possible. While more classic or conventional consumer and marketing research processes can be quite robust, they are lacking in some core implementation areas such as the ability to reflect empathy, appropriately unlocking consumer's behaviour and needs, and asking relevant questions to completely capture the consumers views and beliefs on a product (Lopetcharat and Beckley 2012). QMA provides a single consumer voice, the group working together to find a unified answer, allowing different demographic groups (i.e. Australian and Chinese) to be easily compared. Replicates of this single group voice can (and should) be obtained to validate results.

For this study, QMA sessions were conducted in the sensory science facility within the Faculty of Veterinary and Agricultural Sciences, at the University of Melbourne Parkville campus, Victoria, Australia. Both QMA and focus group methodologies were used under the University of Melbourne human ethics protocol 1646413.

Participants

24 Australian pork consumers (*n*= 17 females, 7 males ages 19-68) and 18 Chinese (people of Chinese decent, newly arriving to Australia < 1 year prior to the study) pork consumers (*n*= 11 females, 7 males ages 23-28) were recruited via online advertising and email lists for sensory

participants for several small panels consisting of 4-8 people per session. Due to the limited number of participants and stringent acceptance criteria, it was difficult to conduct this trial with a balance of genders and age. All participants declared that they were meat and more specifically pork consumers and conducted at minimum 50% of their household shopping, identifying them as the main shopper in the household. A plain language statement was provided with detailed information of the study.

Procedure

Data was collected for all demographic groups following the below procedure, with each focus group proceeding through the initial discussion and three mapping exercises sequentially. Sessions for each demographic happened on separate dates. For Chinese focus groups, a translator facilitated the discussion and mapping exercise along with a trained mediator, experienced in QMA and focus group methodology. All discussions were also recorded in English by two separate researchers present in the room and lasted approximately 1.5 hours. A discussion guide was utilized to facilitate the conversation and reach the learning objectives.

Step 1: A group discussion was held, and recordings were made of the participants habits and behaviour for the purchase and consumption of pork in Australia. For Chinese groups, comparison was made to their habits and behaviour within their native country, and all major differences were noted. Participants were asked to describe why they held certain purchasing habits, and what drove their preferences for the purchase of meat. Mood boards specific to each demographic were used also, and in combination with eating and buying behaviour discussion helped frame the conversations to come during the mapping exercises.

Step 2: Perceptual mapping of on-shelf Australian and Chinese pork products was conducted, where provided samples were placed on a two-dimensional map with the X-axis being: 'Everyday' to 'Premium' and the Y-axis 'Familiar' to 'Unfamiliar'. Both axis were non-numerical and continuous. The definition of 'Everyday' and 'Premium' was discussed at length with participants, as it was more than just a measure of quality. An everyday item may still be considered 'good quality' but lacks certain properties that make it more 'special' than most items found on a supermarket shelf. Premium products likewise are more than just quality, they possess 'delighter' attributes as described by the Kano method (Kano *et al.* 1984). The map was produced on the tabletop which participants sat around and recorded using the Mural.ly app and photographs. Products were selected to be of a wide range encompassing the most popular pork items on Australian and Chinese supermarket shelves. In this first exercise, the actual products were available for participants to inspect and map onto the table, although no tastings took place. For each product, participants were questioned on their familiarity, purchase intent and consumption intent. To begin each session, the moderator placed a single pork loin chop in the centre of the map as a reference point, with all further placements of products made relative to it. This was chosen as it is known to be familiar to both groups and generic, helping to set an anchor point. The analysis focused on the groupings and clusters formed by the participants on the map, and what drove value in their eyes. All conversations were transcribed to capture opinion.

Step 3: Perceptual mapping of Australian pork primal cuts and offal was then conducted for both demographic groups as above, with the same axis. It was stressed to participants from

both demographic groups to assume all products were Australian pork. The anchor point for this exercise was a photograph of a single pork loin chop, with everything else mapped in reference to this. For this mapping exercise photographs were used rather than real products. The map was produced on the tabletop which participants sat around and recorded using the Mural.ly app and photographs. The analysis focused on the groupings and clusters formed by the participants on the map, and what drove value in their eyes. All conversations were transcribed to capture opinion.

Step 4: Perceptual mapping of pork farming practices was conducted for all demographic groups. A range of photographs depicting the main types of farming practices (indoor, barn-raised/eco-shed and free range), under different conditions (high/low stocking density, clean/dirty, etc.) to gain insight into how farming conditions drove perception of value. Samples were again placed on a two-dimensional map with the X-axis being: 'Everyday' to 'Premium' and the Y-axis 'Modern' to 'Traditional'. Both axis were non-numerical and continuous. The first photo shown and used as the anchor point was of a single pig in grass with no obvious farming system, and all following photos mapped in reference to that. The map was produced on the tabletop which participants sat around and recorded using the Mural.ly app and photographs. As participants ranked and mapped each system, they were questioned on their familiarity, opinions and beliefs about each system and condition, and how that was impacting the value they saw in products that were produced this way. All conversations were transcribed to capture opinion.

Step 5: Once all groups and demographics had completed all exercises, the data from each map was collated into a single map for all agreed upon placements of products, which appear in the following results section. Where agreement was not made across groups as to an individual placement, it was not included in the overall results. Detailed notes were taken in the discussion section of the QMA to identify why placements where different across groups.

Data Collection and Analysis

For the QMA studies, discussions were highly consistent within focus groups, with no new topics emerging during the repeat sessions, indicating that thematic saturation was reached in the early, with a high consistency within the focus groups. After the mapping exercise, participants generated thematic groupings for meat cuts and farming practices allowing for identification of value attributes, linkages between groupings, and potential opportunity spaces. The focus groups then further discussed how each grouping was valued and why, describing the groupings common attributes and benefits or shortcomings. Data was transcribed and important information that was provided with consistency across focus groups was annotated and used to identify important recurring themes between groups.

Results

On-Shelf Pork Product Discussion and Perceptual Mapping by Australian and Chinese consumer groups

Insights into on-shelf pork products for Australian consumers are given in Figure 1. All products displayed in this figure were agreed upon between and across all groups. Interestingly, the most familiar and often used items; loin chops (A), mince (B) and schnitzels (C), did not rate as premium even though they were considered to be of good quality. To enter the premium space for Australian consumers, some form of value-add was required, as can

be seen with the glazed ribs (E) and belly rashers (F), and the scotch fillet with herb butter (D). Any foreign labelling immediately reduced the quality of a product, and eating experience was key to drive both good and premium quality measures.

At this stage participants were encouraged to elaborate on what it was about the premium grouping that separated them from the more standard on-shelf products. All consumers agreed that no truly 'Premium' products were presented to them, they had to come from a butcher or market, not the supermarket. Then the first and most commonly agreed upon characteristic was that for a supermarket product to approach premium, it must have value-add properties, but still "look like pork". Instructions on how to cook the product as part of the packaging was also an addition to the products value, as consumers had a general belief that pork was not simple to cook. It was clear that what a consumer considered as premium was very different between a supermarket shelf versus at a butcher or restaurant, where Australian consumers placed immense trust in the expert opinion of those suppliers. While pork products with minimal or no packaging, and without value-add could be good quality, they could not be premium on a supermarket shelf, that could only come with expert opinion, via a butcher or chef. When asked to consider if and how packaging might be able to reflect the quality of a butcher/restaurant, consumers conveyed that the meat be presented as it is in a butcher or restaurant window, placed on dark trays or wooden boards, with less packaging. The final note worth mentioning was that the more green that was presented as part of the packaging, brought consumers towards organic and heathy foods, which did help shift foods into the premium space, but this was less clear cut for meat than other foods.

Figure 1.

The contrasting opinions of Chinese consumers can be seen in Figure 2. Pork schnitzels are missing from this map as they were highly unfamiliar to the Chinese consumers and there was huge variation of where they were mapped between groups. The first noteworthy finding from the Chinese participants was that they mainly sourced their pork from supermarket chains, not from markets or butchers (which was unexpected and did not reflect the buying behaviour in their home country), with their choice of cut dependent heavily on the meal they intended to cook. They expressed that the pork options available to them on Australian supermarket shelves were of decent quality but lacking in choice. Initial expectations for high familiarity among all Chinese products was not seen in the results, due to diet and available products being highly correlated to different regions of China, hence few Chinese products that were part of the exercise made it to the final results.

Overall, the mapping process with the Chinese participants was a much more logical exercise, forming a very linear map. While the highly familiar Chinese snack products were rated as everyday rather than premium, this did not reflect any issues with quality and all participants expressed a large appetite for all products grouped here. Not only did participants express a visceral desire for these snacking products, they lamented that they were not readily available on Australian shelves and were without comparable Australian products. This gap for a pork snacking product seen in both the Australian and Chinese demographic groups suggests a potential area of growth for the Australian pork industry. The most commonly consumed products (highlighted in green) were considered to be of decent quality but not in any way designed for Chinese consumers. A significant amount of further preparation was required

for any product purchased, as the cuts were wrong for what Chinese consumers desire in their cooking. The most common issue raised was that the steak cuts of fresh pork products offered on Australian shelves were too large and cut too thickly. Unfamiliar products were considered to be premium mainly due to packaging. On further questioning and discussion, the majority of Chinese participants admitted they would be far more likely to try these products if cooked by an Australian friend, and were unlikely to purchase or cook these products personally. Value-add products with marinade were considered for the most part undesirable as they would rather make more traditional marinades themselves, which was paradoxical to them being mapped as premium. The highest indicator of a premium on shelf product for these consumers was vacuum packaging, which gave a clear impression of freshness, allowed the consumers to touch the meat and inspect its tenderness, and reduced the appearance of drip loss in the meat which was highly negative for Chinese consumers. Green packaging elements reflected organic, in a similar way to Australian consumers, although Chinese consumers mentioned that several other colour elements to be positive, with few negative remarks made towards the colour scheme of the packaging in products used.

Figure 2.

Pork Primal Cuts and Offal Product Discussion and Perceptual Mapping by Australian and Chinese consumer groups

Results from the pork primal cuts and offal products for Australian consumers can be seen in Figure 3. All opinions offered by consumers were clearly married to past eating experiences. The cuts identified as 'top of the line' were well known to the participants, and highly purchased products. Lesser known cuts that were often met with confusion as to what they were (i.e. a tenderloin was regarded as a beef product), and without a memorable eating experience or name recognition the value was unable to be agreed upon within and between groups. Larger cuts of meat were less premium as they required more preparation for cooking, i.e. a chop was more premium than a full tenderloin. Thicker cuts, with more lean tissue and less fat were seen as better value for money, but at the same time, fat was a key part of a premium product. The importance of fat was dependent on the cut or product, being a premium marker for a steak but not for mince. Marbling was a term often discussed in groups but not reflected in participants overall mapping of the cuts. In rating these products, professional and trusted expertise was key for premiumness, with butchers and restaurants key figures for identification of premium meat cuts, and artisanal preparation a bonus for any premium product.

Several terms such as free range, dry aged, and grass fed were discussed commonly in all groups around premium meat products, but what exactly linked those terms to pork specifically was not something any group was able to answer. All groups showed intrigue at the group outlined in yellow, seeing them as specialty products although they had little to no eating experience with products grouped here. All offal was placed together (highlighted in purple) with groups consistently stating they would not eat these products. The only exceptions to this were hocks and marrow bones, which were not placed with the other offal due to their potential for soup stock and some more European eating experiences. There was not, however, agreement otherwise on where they should be placed between all groups and so are not displayed on the map in Figure 3.

Figure 3

Results for the Chinese demographic group can be seen in Figure 4. Meat selection and mapping was a far simpler exercise for Chinese participants, resulting in a highly linear map with no obvious groupings. During the mapping exercise participants expressed that there was little differentiation between meat products, feeling that they were being presented the same product repeatedly. Due to this they mapped on familiarity more so than preference, with no particular muscle or cut type standing out as more desirable. Participants explained that meat selection was done looking at colour, with pink an identifier of freshness and quality. Fat, skin and bone are considerations only dependent on the meal being prepared, with their absence or presence in no other way impacting quality or premiumness. Size was also described as highly important echoing the previous mapping exercise (Figure 2), as they felt everything presented was too large.

Unlike Australian consumers who considered all offal as unfamiliar and inedible (Figure 3), offal products were highly differentiated for Chinese participants. They were grouped closely as all were highly familiar, but each had a large degree of tradition, culture and eating experience and specific preparation. All offal products shown to the participants were highly liked and desirable. It was noted that offerings of these products within Australia were cheaper than when purchased in their home country, but also of far lower quality, not prepared right, and in some cases even described as being 'dirty'. Participants also expressed that most offal products would be purchased if available on supermarket shelves, with the only barrier being the complex cooking method of some offal products (i.e. stomach, intestine and ears).

Figure 4.

Farming Practices Discussion and Perceptual Mapping by Australian and Chinese consumer groups

The Australian results for the farming practices discussion and QMA can be seen in Figure 5. The mapping exercise initially unfolded as expected with a linear progression from everyday to premium from indoor farms with high stocking densities to free range farms with lower stocking density. Axis names were changed for the perceptual mapping of farm systems as this terminology was more applicable but still in line with familiarity. What was interesting was the clear correlation between modern farms being considered everyday quality and traditional farms being premium. During discussion on farming practices, participants strongly expressed a strong mistrust of industry. All photos displaying positive images of farming presented to them were believed to be misleading, with even the barn/eco-shed systems shown often described as 'factory' farms. Anytime fencing, walls or enclosures of any type were present in a farm setting it was met with a rapid drop in opinion, even in an outdoor system. Consumers felt that any such inclusion was unnatural and would impact on the 'happiness' and comfort of the animals. When prompted to expand on their thoughts around a particular system the groups and individuals had a strong attitude towards, more in-depth discussion very quickly led to confusion within the group, exhibiting a genuine lack of knowledge of all farming systems leading to an inconsistent and distorted view of how meat was produced among all groups.

What was emphatically clear was that the biggest factor in Australian opinion of best farming practices was scale, not the system itself. A small scale linked to traditional methods led to trust in the participants. The belief was consistently presented within and between groups that animal welfare, and ethical food production was only possible on a small scale, as the size of the farming operation increased so did the negative connotations associated with farming. It became clear after completion of this exercise with all Australian groups, that thinking of farming in terms of scale rather than free-range or indoor, lead the participants away from welfare concerns and towards eating experience and taste. The linearity of the map show that these two factors are closely linked for Australian consumers. A better axis for future research will be 'farm size'.

Figure 5.

Chinese opinion of Australian pork farming practices can be seen in Figure 6. Attitudes towards farming systems were almost entirely positive, in stark opposition to Australian participants, with a majority of discussion based around the benefits of each system as differentiators, not the issues that Australian participants were quick to discuss. The Chinese demographic showed no strong preference for any system, with no clear groupings able to be made, with mapping placement being dependent on the look of each system not a preference for one over another. They clearly and openly differentiated that these were their opinions of Australian farms only, and that their opinions of similar systems in China would be significantly different. This was particularly true for the free-range systems, which they were unfavourable towards within Chinese production but satisfactory in Australia due to their perception of Australia as clean and free from pollutants. In stark contrast to Australian results, animal welfare was not discussed in any Chinese group. Chinese consumers were not interested in animal welfare, even when directly challenged by the mediator. Differentiations between systems were made on access to cover, cleanliness, and perceived comfort of the animal within that system due to a range of factors such as temperature exposure and stocking density. Chinese consumers in all groups believed Australian farming practices were of a high standard, emphasising the clean air and land, and lack of pollutants in our systems.

Figure 6.

Discussion

This research is a significant step towards bridging the gap in understanding of cultural differences and influences that determine buying behaviour of pork. The qualitative data presented shows a clear divide in opinion towards Australian pork for both Australian and Chinese consumers, and in their perception of premium when it comes to purchasing pork. Australian consumers desired expert opinion, traditional meat cuts well known to them through prior eating experience with minimal packaging, and small-scale production reflecting a perception of better animal welfare. Further information on production methods was not desired. Chinese consumers wanted clean, healthy and versatile products, with consistent quality. They expressed that currently there are not any products on Australian supermarket shelves made for them, and that there is a lack of pork snacks and offal products available. The further understanding we develop around these benefits, irritations, and even confusions of products is highly valuable throughout the supply chain. Research has shown consistently that brand value and loyalties are becoming an endangered species in food, and practical implications suggest that you must define the features of a product in terms of

perceived functionality, as seen in the eyes of their consumers across various segments (Upshaw 1995; Rust *et al.* 2004; Gabay *et al.* 2009). While quantitative studies are a key next step, qualitative research such as this is key to identifying these product features and their perceived functionality within target consumer segments.

There were several key outcomes and insights for the Australian participants. Firstly, the negativity and mistrust expressed toward meat production was evident in almost all discussions held, particularly with older participants (age >35) within the groups. There was a belief that the photos of farming systems presented to them were misleading, and any scientific opinions or facts raised by other participants were attempts at deception from large meat production bodies, although few specifics were ever available for identification on who that could be. Although the mapping of farm systems saw free-range farms identified as 'best-practice' (Figure 5) due to perceived welfare benefits, these farms were still not seen as high welfare environments and were still seen as a negative. Herein lies the major benefit of the QMA method, with the discussion informing the mapping exercise and capturing the specific opinions of consumers driving the placement of stimuli on the map. Using traditional survey or ranking methods, it would appear that there was a great improvement in overall opinion towards free-range farming over other farming practices. The results of this study suggest that although free-range pig farming is indeed seen as the best current method of production in the eyes of the consumer, all systems are seen as a negative, signifying that any promotion of farming methods as a driver for premium may not be ideal for Australian consumers.

While welfare was clearly and consistently the most discussed topic within all Australian groups, how it was discussed was not consistent nor were the beliefs held and facts presented by different individuals within and between groups. Recent studies have shown that while consumers will generally rank welfare as important, they also rank it low relative to other societal problems (Thorslund *et al.* 2017). It is therefore likely that the discussion of welfare in relation to meat production and its impact on pork value, was the result of participants talking as citizens and not consumers, expressing their personal values about ideal society rather than their consumer preferences while making a purchasing decision. Further to this point, while consumers have wide ranging concerns with pig welfare their main focus is on naturalness, believing that the more natural environment that is presented the better it must be for the animal, and the importance of 'happy pigs' having a 'happy life' (Harper and Makatouni 2002; Lassen *et al.* 2006; Thorslund *et al.* 2017). This is particularly true for Australian consumers due to their urbanisation and the populations lack of knowledge on how food is produced. This perception of happier animals is likely achievable through marketing efforts, and the desire for naturalness was clearly reflected in the results of this study. It is also suggested in the literature, that welfare is highly associated with eating quality (Thorslund *et al.* 2017), so there are many further avenues to cue high welfare standards other than the promotion of free-range, due to these results showing that all farming practices are held in a negative opinion, with no current system linking to cues for naturalness or happier animals. The Australian mapping of farm systems (Figure 5) was highly reflective of past research where welfare is based on idyllic images of farming practices and animal production in the countryside (Bracke *et al.* 2005).

Another key outcome from Australian consumers was their inconsistency in knowledge around pork products and meat cuts. Australian consumers did not trust their knowledge on

cuts and product type, quality assessment, preparation or cooking. Currently, this lack of familiarity and recognition is a barrier stopping positive eating experiences in pork driving value in specific products. Market segments are formed around the different attitudes people hold toward various blends of product features such as packaging and presentation to the customer, which can be a principal driver of value (Gabay *et al.* 2009). The Australian pork industry has put some marketing effort into cooking time and preparation with campaigns such as '6-2-2' advertising (APL, 2020), but consumers still appear confused with this issue. The unfamiliarity of pork cuts, and how they relate to quality may be a future avenue for advertising campaigns and product development. Australians who are experienced cooks are comfortable purchasing premium meat from high end butchers for home preparation, whereas many Asians and non-experienced Australians would prefer these premium eating experiences happen within a restaurant, where professionals have the responsibility of ensuring a good eating experience (Hastie *et al.* 2020). It was clear from these results that the familiarity Australian consumers had with pork was low compared to other meats. Additionally, any future premium product development would need to be minimalistic in its packaging, and supermarkets were not the channel for these to be sold through without efforts made to educate consumers on pork quality assessment and cut selection.

It was far from a revelation that Chinese consumers possessed decidedly differing opinions towards pork from their Australian counterparts. How and why they held these opinions, and how they differentiated that these opinions were held for Australian pork consumed in Australia, and not necessarily their opinions of pork from their home country was where the insights were found. There were several key findings for Chinese Participants. Firstly, they did not feel that any products on the Australian shelf were designed for them, which was a belief held consistently with all groups. Vacuum packaging was a must, and immediately identified as a signifier of premiumness. There was also a gap in pork snacking products, and in pork offal, and the offal that was available in Australia was mentioned to be poorly prepared and not of high quality compared to what was available in China. Development of appropriate cuts, in vacuum packaging would be a quick and easy outlet for Australian producers to immediately open an avenue to a new engaged consumer base. The lack of familiarity with the Chinese products shown in the first mapping exercise (Figure 2) was initially surprising, yet considering the evolving geographic differences in China and the persistence of huge variations in economic profiles of different cities, not to mention the geographic differences in food preferences in China this should not have been a revelation (Euromonitor 2011, 2017).

The Chinese market is known to be both incredibly diverse, and evolving rapidly with a drive towards urbanisation, more curious and less loyal customers, and growing discretionary spending leading the rise of consumerism (Atsmon *et al.* 2012). However, the immense cultural ties between pork and the Chinese people make opinions held for pork more consistent. Pigs have been raised and consumed in Chinese households for centuries, the huge cultural impact of pork production and consumption is even evident in their language (Schneider and Sharma 2014). In Mandarin, the general word for meat (rou) refers to pork and the Chinese character for home and family, 家(jia), was created some 3,500 years ago by adding the roof radical to the pig radical, or more figuratively, by putting a roof over a pig's head (Schneider and Sharma 2014). This cultural significance is key in any attempt to develop a product for China, where meat signifies progress against a backdrop of scarcity, a progress

that the government is keen to count among its modern accomplishments (Schneider and Sharma 2014).

While there are currently no avenues for Australian pork to be exported directly to mainland China, the data collected by this project can still be incredibly beneficial. There has been prolific spread of Chinese communities throughout ASEAN nations, and even within Australia. This wave of Chinese migration is known as Chinese diaspora. There are approximately 46 million Chinese people living outside of China, Hong Kong, Taiwan and Macau, 30 million of these migrants live within other ASEAN nations constituting approximately 10% of the population of Southeast Asia, and close to one million within Australia (Anonymous 2014). These one million pork consuming shoppers make up a significant segment of Australia's market, and as shown by these results, Chinese shoppers within Australia do not feel like there is a single product on a supermarket shelf designed for them. The compatible markets offered by Chinese and Australian consumer preferences were again highlighted by these results, with Chinese consumers being far more accepting of meat cuts and offal deemed unacceptable by Australian consumers. Further to this point, the high opinion of Australian farming practices, lack of perceived pollution and cleanliness of Australian pork in general would likely benefit the development of offal products even more than meat.

Packaging for Chinese consumers seems viable with several colours and designs, but for a product to be considered premium it must be in vacuum packaging. Tenderness is gauged by pressing a finger into the cut of meat, MAP or overwrap style packaging doesn't allow for this critical step and is a barrier to purchase. It must be noted that the one demographic within Chinese participants that was not captured in this research was older consumers (age >35), which was able to be captured within the Australian data. The authors do not believe this has a large impact on the outcomes of the study, and the analysis of younger Chinese consumers will make these outcomes applicable to the key future opinion leaders. This gap will also be addressed in future research.

In conclusion, the research conducted, and results presented are a crucial first step into proper understanding of the impact culture has on value, and the development of premium products in Australian pork. The combination of compatible markets offered by Australian and Chinese consumer preference shown in these results, Chinese diaspora opening up domestic and international avenues for a new consumer base, and the acceptability of Australian pork shown by Chinese consumers, all give great promise to Australian pork producers looking for more stable and diverse avenues to sell their products. Further research and development is required, and the results of this project are to be entered into a conjoint analysis for quantitative testing and further insight into the power of the opinions expressed in the presented research.

Conflicts of Interest

Frank Dunshea is an Associate Editor. Despite this relationship, he did not at any stage have editor-level access to this manuscript while in peer review, as is the standard practice when handling manuscripts submitted by an editor of this journal. The authors have no further conflicts of interest to declare

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Figure Captions

Figure 1. Perceptual map generated by Australian consumers in the qualitative multivariate analysis (QMA) of on-shelf products for all groups. The Australian pork loin chops were the first shown, with everything else mapped relative to it. (**A**) Australian pork loin chops; (**B**) Pork mince (no obvious country of origin); (**C**) Australian pork schnitzel (SunPork brand); (**D**) Australian pork scotch fillet steak with herb butter (Bruemar brand); (**E**) Australian BBQ glazed pork ribs (SunPork brand); (**F**) Australian seasoned pork belly rashers (SunPork brand); (**G**) Frozen sliced pork belly (Chinese labelling); (**H**) Chinese honey pork jerky; (**I**) Chinese pork luncheon meat (canned).

Figure 2. Perceptual map generated by Chinese consumers in the qualitative multivariate analysis (QMA) of on-shelf products for all groups. The Australian pork loin chops were the first shown, with everything else mapped relative to it. (**A**) Australian pork loin chops; (**B**) Pork mince (no obvious country of origin); (**C***) Australian pork schnitzel (SunPork brand); (**D**) Australian pork scotch fillet steak with herb butter (Bruemar brand); (**E**) Australian BBQ glazed pork ribs (SunPork brand); (**F**) Australian seasoned pork belly rashers (SunPork brand); (**G**) Frozen sliced pork belly (Chinese labelling); (**H**) Chinese honey pork jerky; (**I**) Chinese pork luncheon meat (canned). *C not shown in figure as there was not agreement on placement across groups.

Figure 3. Perceptual map generated by Australian consumers in the qualitative multivariate analysis (QMA) of pork primal cuts and offal for all groups. The loin chop was the first shown, with everything else mapped relative to it. All products represented were assumed to be Australian pork. (**A**) Loin chop; (**B**) Belly; (**C**) Ribs; (**D**) French dressed cutlets; (**E**) Rolled shoulder roast; (**F**) Mince; (**G**) Diced loin; (**H**) Full leg; (**I**) Jowell; (**J**) Half carcass; (**K**) Suckling pig; (**L**) Heart; (**M**) Ear; (**N**) Tongue; (**O**) Intestines; (**P**) Trotters.

Figure 4. Perceptual map generated by Chinese consumers in the qualitative multivariate analysis (QMA) of pork primal cuts and offal for all groups. The loin chop was the first shown, with everything else mapped relative to it. All products represented were assumed to be Australian pork. (**A**) Loin chop; (**B**) Belly; (**C**) Ribs; (**D**) French

dressed cutlets; (**E**) Rolled shoulder roast; (**F**) Mince; (**G**) Diced loin; (**H**) Full leg; (**I**) Jowell; (**J**) Half carcass; (**K**) Suckling pig; (**L**) Heart; (**M**) Ear; (**N**) Tongue; (**O**) Intestines; (**P**) Trotters.

Figure 5. Perceptual map generated by Australian consumers in the qualitative multivariate analysis (QMA) of pork farming practices for all groups. The single pig in grass was the first shown, with everything else mapped relative to it. All farms represented were assumed to be Australian. (**A**) Indoor, dirty with high stocking density; (**B**) Indoor, dirty with cages visible; (**C**) Indoor, clean with high stocking density; (**D**) Indoor, clean deep litter, low stocking density; (**E**) Eco-shed (outdoor barn), deep litter; (**F**) Free range, dirty with grass; (**G**) Free range, dirty no grass; (**H**) Free range, sunshine with grass; (**I**) Free range, backyard farm.

Figure 6. Perceptual map generated by Chinese consumers in the qualitative multivariate analysis (QMA) of pork farming practices for all groups. The single pig in grass was the first shown, with everything else mapped relative to it. All farms represented were assumed to be Australian. (**A**) Indoor, dirty with high stocking density; (**B**) Indoor, dirty with cages visible; (**C**) Indoor, clean with high stocking density; (**D**) Indoor, clean deep litter, low stocking density; (**E**) Eco-shed (outdoor barn), deep litter; (**F**) Free range, dirty with grass; (**G**) Free range, dirty no grass; (**H**) Free range, sunshine with grass; (**I**) Free range, backyard farm.