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Exploring barriers to fresh and total pork consumption among children: parental perspectives: 3B-108 Report prepared for the Co-operative Research Centre for High Integrity Australian Pork

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Abstract

Pork represents a core food in the diet which provides key nutrients such as protein, thiamin and selenium. Analysis of a large, nationally representative dietary survey of Australian children identified that half of the children reported consuming pork, but this was generally in the form of processed pork such as ham and bacon. Fresh pork was not commonly included in their diets [1]. To identify barriers to fresh pork consumption in children, six semi-structured focus group interviews were conducted with 31 parents or carers of children aged 2 - 16 years who consumed meat (mean age of parents was 42.5 y (range = 27-57 y), and mean age of their children was 8.4 years). A number of key themes emerged from the focus groups in relation to fresh pork intake, namely: a lack of confidence and knowledge relating to the preparation and cooking of fresh pork; poor acceptability of fresh pork by some children due to taste and texture; influence of family and cultural traditions on pork consumption; low visibility and perceived availability of pork in comparison to other meats; and a perceived high cost of value-added pork products. Parents reported that pork was an acceptable meat to include in children's meals and there was an overall perception that fresh pork was a healthy meat, because of its leanness. In contrast, several participants discussed concerns relating to the high sodium and/or fat content of processed pork products including ham, bacon and cured pork products. Despite these nutrition-related concerns, processed pork products were seen as easy and convenient foods that were well accepted by children.

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EXPLORING BARRIERS TO FRESH AND TOTAL PORK CONSUMPTION AMONG CHILDREN: PARENTAL PERSPECTIVES

3B-108

Report prepared for the
Co-operative Research Centre for High Integrity Australian Pork

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Executive Summary

Pork represents a core food in the diet which provides key nutrients such as protein, thiamin and selenium. Analysis of a large, nationally representative dietary survey of Australian children identified that half of the children reported consuming pork, but this was generally in the form of processed pork such as ham and bacon. Fresh pork was not commonly included in their diets [1].

To identify barriers to fresh pork consumption in children, six semi-structured focus group interviews were conducted with 31 parents or carers of children aged 2 - 16 years who consumed meat (mean age of parents was 42.5 y (range = 27-57 y), and mean age of their children was 8.4 years). A number of key themes emerged from the focus groups in relation to fresh pork intake, namely: a lack of confidence and knowledge relating to the preparation and cooking of fresh pork; poor acceptability of fresh pork by some children due to taste and texture; influence of family and cultural traditions on pork consumption; low visibility and perceived availability of pork in comparison to other meats; and a perceived high cost of value-added pork products.

Parents reported that pork was an acceptable meat to include in children's meals and there was an overall perception that fresh pork was a healthy meat, because of its leanness. In contrast, several participants discussed concerns relating to the high sodium and/or fat content of processed pork products including ham, bacon and cured pork products. Despite these nutrition-related concerns, processed pork products were seen as easy and convenient foods that were well accepted by children.

Family and cultural traditions were highlighted as having a large impact on the frequency and type of pork participants served to their families. Participants of Asian heritage in particular highlighted how this influenced their regular consumption of fresh pork. Other participants identified a strong link between fresh pork and special occasions, with roast pork, specifically, being identified as a meal item key element at Christmas. Religious beliefs did not directly impact on pork consumption for the majority of participants.

Barriers to fresh pork consumption by children were identified. Parents generally lacked confidence regarding the preparation and cooking of fresh pork, and perceived that pork needs to be cooked well-done, which impacts adversely on children's acceptance of the meat. A need for pork recipes and cooking inspiration was identified.

Pork was identified as having low visibility in shopping outlets, compared to other meats such as beef or chicken. Participants felt that the variety of cuts for pork limited the versatility of this as a meat source. There was evidence that advertising campaigns had resonance, with most participants recalling the 'Get Some Pork on Your Fork' campaign of Australian Pork Limited. Participants felt however that pork was not advertised to the same extent as beef and chicken, and believed that additional exposure on the variety of ways to cook pork would encourage them to purchase it for their children.

Concerns related to animal welfare and country of origin were discussed by a small number of participants but these were not major determinants of pork purchasing behavior. Likewise, participants did not check the country of origin when purchasing pork, as they assumed that all pork (both fresh and processed) was of Australian origin. Popular portrayal of pigs in children's television programs and movies was seen as a potential barrier to consumption in younger children.

Children's preferences were considered important factors in the choice of family meals. Fussy eating was discussed as a common barrier to including a variety of foods to children, including fresh pork. The texture of fresh pork was identified as being disliked by younger children. Many participants reported that their children preferred dishes where pork was

presented as part of a mixed dish, such as a curry or stir fry rather than as a single piece of meat, with the exception of roast pork. Involving children in the preparation of dishes containing fresh pork, such as pork dumplings, san choy bow, and pork meatballs, was identified as a strategy used by parents to improve the acceptance of these meals. Perception of boar taint was identified as a barrier to taste acceptability by some individuals.

This research has provided key insights into consumer behavior in relation to the positioning of pork within the diets of Australian children. Overall fresh pork was considered to be a healthy meat option, but a need for convenient recipes that would appeal to children was identified. A lack of visibility of pork in contrast to other meats was perceived, with a need to engage with media and cooking programs to improve awareness of pork discussed. A need for more information regarding both the unique nutrition characteristics of pork and appropriate cooking methods was also identified. Exposure to foods in early childhood contributes to lifelong eating habits, therefore ways in which to overcome the identified barriers could position fresh pork more prominently in the meal repertoire of Australian families and future generations.

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1. Introduction

Pork represents a core food within many Australian cuisine contexts. Previous Pork Cooperative Research Council (CRC) funded research which examined pork consumption in a representative sample of Australian children found that pork was consumed by approximately half of all children surveyed [1]. In the same study, pork consumption also contributed to intakes of a number of key nutrients such as protein, niacin and zinc, highlighting its role in the diets of Australian children. In particular, fresh pork was found to contribute greater amounts of favourable nutrients such as thiamine, long-chain omega-3, phosphorous, and potassium than processed pork. Reasons why children do not regularly consume fresh pork are unclear.

In order to understand these patterns of pork consumption, perceptions of pork need to be further investigated. Previous qualitative research has examined perceptions of pork consumption in adults. Research suggests that consumers view pork as being suitable for a variety of dishes, pleasant tasting and accessible [2]. Whilst some studies reported that participants considered pork to be good value for money [2, 3], others believed that other protein sources such as poultry were less expensive [4] or reported finding it difficult to evaluate pork's value for money [5]. Similarly, literature investigating consumer's perception of the healthfulness of pork has reported conflicting results, with one study suggesting consumers perceived pork to be a fatty meat [6], whilst another found pork to be considered less fatty than beef or lamb [3]. Fresh pork has also been found to be perceived to be less healthy than poultry [4], indicating inconsistency in consumers' perceptions of the healthfulness of pork.

The majority of the previous research examining consumer perceptions of pork consumption has been conducted in Europe. Given the role that traditional diets play in influencing perceptions of other core foods such as fish [7], and the associations found between a child's cultural background and pork consumption in the previous Pork CRC funded study [1], it is vital that research be conducted in the Australian context. Australian Pork Limited funded research has examined consumer perceptions of the health and nutritional benefits of pork consumption in comparison to other meats, and has identified a range of perceptions relating to pork consumption (Smith et al., personal communication). Whilst this research highlighted that children's preferences may influence their parent's purchases, no known research has examined perceptions of pork consumption specifically related to children, or motivators and barriers which specifically influence children's consumption.

Focus group research can assist in exploring participant's attitudes through facilitation of participant communication [8]. These groups allow for not only the exploration of knowledge and perceptions, but also the reasons behind such perceptions [9]. As a result, focus groups can be instrumental in exploring children's pork consumption practices, and in assisting in the development of informed, guided marketing strategies to increase pork consumption in this important demographic group.

The aim of this study was to investigate parents' perceptions of factors affecting their children's consumption of pork, and identification of barriers to the consumption of fresh pork, in particular.

2. Methodology

Semi-structured focus group interviews were conducted among parents of children to assess pork consumption patterns, and perceived barriers to fresh and total pork consumption.

Participants were initially recruited via invitation throughout the day at a Wollongong shopping centre (Wollongong Central Shopping Centre). To ensure that working parents were also included in the research, emails were also sent to all general and academic staff at the University of Wollongong. Participants met the study inclusion criteria if they were a parent or carer of a child aged 2 - 16 years who consumed meat that was involved in food purchasing and/or preparation. Participants were excluded if they could not speak conversational English or did not have at least one child who was within the age of interest (2-16 years). All interested participants were provided with an information sheet and consent form which outlined the research and were provided with a parking voucher for the University of Wollongong. All participants were also provided with a gift voucher as an acknowledgement of their contribution. Ethical approval for the study was granted by the University of Wollongong/Illawarra and Shoalhaven Local Health Network District Social Science Human Research Ethics Committee (HE 13/429) and signed informed consent was obtained from all participants.

All focus groups were conducted in December 2013 and each ran for approximately one hour. Each group was run by an experienced moderator (DNC), with an observer (EN or KC) present to take notes on both the discussion and non-verbal cues made by participants, such as facial expression and body language, as recommended by Wong [10]. At the beginning of each session, participants were oriented to the purpose of the focus groups, and were informed that all data would be de-identified prior to analysis. Participants were encouraged to express their thoughts freely and were informed that they were free to leave the group at any time. All participants provided information regarding their own gender, age, highest level of education, their role in food preparation/purchasing and the number and age of their children in written questionnaires prior to the focus group.

To ensure comparability of results between groups, discussion questions were standardised, as outlined in Figure 1. Development of the study questions was based on the procedures suggested by Krueger and Casey [11], with topics included in the facilitator's guide developed by the study investigators in consultation with Pork CRC and representatives from Australian Pork Limited (APL). The questions related to participants' opinions about their children's eating habits in relation to pork, and addressed factors which encouraged or discouraged pork consumption, as well as consumption of specific types of pork. Where appropriate, probing questions were used to allow participants to clarify or expand on comments.

During the focus groups, participants were shown two pork products (Bruemar pork cutlets with Mediterranean glaze and Woolworths Select Korean style pork belly rashers) as examples of value-added products to stimulate discussion on their perceptions on these types of pork products (see Question 10 in Figure 1).

1. When you think of meat in general, what types of thoughts come to mind?
2. What types of meat do your children eat?
 - 2a. Follow-up questions to explore further: Why do they eat/not eat that type of meat? Child's preferences, family preferences, cost, convenience, health, familiarity?
3. When you think of pork specifically, what types of thoughts come to mind?

- 3a. Probe regarding categories/types of pork and thoughts/opinions on these
4. What have been your experiences with your children eating pork/you preparing and serving it as a family meal?
 - 4a. Probe regarding parent's cooking experiences with pork, how it was cooked, types cooked, any issues with taste/flavour/texture following meal preparation
5. What types of pork do your children eat?
 - 5a. Probe: do they eat fresh or processed pork and why/why not? What are their favourite types to eat?
6. Why do they eat/not eat pork or specific types of pork?
 - 6a. Probe: Child's preferences, family preferences, cost, convenience, health, familiarity?
7. What do you think would encourage your children to eat more fresh pork?
8. What do you think are the barriers to your children eating more fresh pork?
 - 8a. Probe: child's or family's preferences, cost, familiarity?
9. What are the factors that influence the types of pork you choose to buy/prepare for your children?
 - 9a. Probe: price, perceived healthfulness, country of origin, recipe familiarity
10. What are your thoughts on value added pork products?
 - 10a. Probe: show examples of packaging of such products to assist participants to identify these products

Figure 1: Discussion questions asked during the focus groups

Data analysis

Demographic data was analysed using Statistical Package for Social Sciences (SPSS) Version 17.0 (SPSS Inc., Chicago IL, USA). Where necessary, chi-squared analyses were conducted to compare results between participants recruited from the shopping centre and via the University of Wollongong. All focus groups were digitally recorded, transcribed verbatim and de-identified. Focus group transcripts were uploaded into a computer software package, NVivo 10 for Windows (QSR International Pty Ltd, Melbourne, Australia, 2014) to identify key themes from the groups.

In order to ensure that the results of the focus groups were reported in a scientifically rigorous manner and to facilitate publication in a peer-reviewed journal, data analysis was conducted according to the Framework analysis technique [12, 13]. This method has been used widely in health-based qualitative research [14-17], including studies focusing on childhood [18-21]. As prescribed by the analysis method, investigators initially familiarised themselves with the data by studying transcripts and observation notes. A thematic framework was then identified and transcribed data was coded into a number of relevant sub-themes. These sub-themes were then grouped and mapped into a number of larger themes, representing a broader conceptual framework. Final thematic analysis, categorisation and conclusions were reached by consensus of all members of the research team (DNC, EN and KC).

3. Outcomes

Fifty one individuals expressed interest in participating in the focus groups. Six focus groups with 31 participants in total were completed. The reasons for interested individuals not participating in the groups included other time commitments and an inability to speak conversational English. Details of

participant's characteristics are shown in Table 1. The majority of participants were females, and most were the main food purchaser and preparer in their household. When considering only children in the target age range of two to 16 years, the mean age of participants' children was 8.4±4.7 years; however due to participants also having children who were younger or older than the target range, the mean age of all children was 9.3±6.2 years. Although over 70% of participants had a University education, the level of education did not differ between participants recruited at the local shopping centre and those recruited from the University of Wollongong ($\chi^2(3) = 4.94, p=0.18$).

Table 1: Characteristics of focus group participants

Gender:	
- Females	24 (77.4%)
- Males	7 (22.6%)
Mean (range) age of participant	42.5 years (range: 27 - 57 years)
Highest level of education:	
- Year 10	0 (0%)
- Year 12	2 (6.5%)
- TAFE or equivalent	5 (16.1%)
- University	23 (74.2%)
- Not stated	1 (3.2%)
Number of children:	
- One child	8 (25.8%)
- Two children	15 (48.4%)
- Three children	6 (19.4%)
- Four children	2 (6.5%)
Main food purchaser:	
- Yes	17 (54.8%)
- No	2 (6.5%)
- Shared with partner	12 (38.7%)
Main food preparer:	
- Yes	19 (61.3%)
- No	2 (6.5%)
- Shared with partner	10 (32.3%)
Mean (range) age of children (in selected age range only)	8.4 years (range: 2 - 16 years)
Mean (range) age of all children	9.3 years (range: 1 - 26 years)

A summary of the key themes and sub-themes which emerged during the focus groups are summarized in Table 2.

Table 2: Summary of key themes and sub-themes identified in the focus groups

Key theme	Sub-theme
Family pork practices	<ul style="list-style-type: none"> • Pork as part of a meal plan • Parents' preferences influencing children's pork intake
Preparing and cooking pork	<ul style="list-style-type: none"> • Parents' perceptions that pork is acceptable to prepare • Perception that pork needs to be cooked until well-done • Lack of confidence or experience with cooking pork • Need for pork recipes and cooking inspiration • Perception of boar taint
Pork as part of tradition and culture	<ul style="list-style-type: none"> • Religion
Animal welfare and country of origin	<ul style="list-style-type: none"> • Children's concern for animal welfare • Country of origin

Key theme	Sub-theme
Pork availability and awareness	<ul style="list-style-type: none"> • Lack of visibility of pork • Lack of access to a variety of pork cuts • Awareness of pork in the media
Cost of pork	
Parents' perceptions of the healthfulness of pork	
Perceptions of processed pork	<ul style="list-style-type: none"> • Processed pork as a convenience food • Children's preferences for processed pork products • Parents not associating processed pork as a type of pork
Children's fresh pork preferences	
Barriers to children's pork consumption	<ul style="list-style-type: none"> • Fussy eating behaviour in children • Children's perception of pork as a fatty meat • Texture of fresh pork • Children's inability to differentiate between pork types • Flavour preferences
Parents' perceptions of value added pork products	<ul style="list-style-type: none"> • Positive perceptions of value added pork products • Negative perceptions of value added pork products • Cost of value added pork products

Themes and sub-themes which emerged during the focus groups are also explored below, with exemplar quotes presented to provide an example of the theme. Saturation (when no new themes emerge from the discussion) was observed by the fourth group suggesting that a comprehensive understanding of the topic was achieved.

Family pork practices

Participants discussed the different ways pork was prepared and consumed by their families, with a large variety of different cuts and techniques discussed. A summary of the pork dishes highlighted by participants is presented in Table 3.

Table 3 - Pork dishes reported as being regularly consumed by focus group participants and their families

- Roast pork
- Pork belly
- Pork chops
- Pork stir fry (using pork loin)
- Bolognaise-based sauce (using pork mince mixed with beef mince)
- Pork sausages
- Pork medallions
- Pork curry
- Pork fillet
- Pork stuffed capsicum and cabbage rolls
- Dumplings
- Processed pork in sandwiches, omelettes, pasta

Pork as part of a meal plan

Several participants also referred to the position of pork in their weekly or fortnightly meal plan. These participants expressed a preference for planning their meals and food shopping ahead, and preferred to choose dishes beforehand

and then shop for the ingredients, as opposed to purchasing pork prior to deciding how to serve it.

“I do my grocery shopping on a Friday after work, I’ll ask them what they want to eat next week... I’ll go out and buy, buy the pork and make, make my dish, um so don’t really look at the prices, um I’ll have in my, you know, my head what I want to cook for next week, all the dinners planned out and that’s what I’ll buy” (Group 1, female, mean child age 12 years)

Parent’s preferences influencing children’s pork intake

Participants frequently referred to their children’s pork consumption as being driven by their own preferences. As many of the participants were the primary food purchaser or preparer in the household, they often chose to serve dishes which they enjoyed to serve their families, with many participants actively encouraging their children to try foods based on their own preferences. Similarly, participants reported not serving dishes they did not like to their children, or adjusting their family’s eating patterns to coincide with their own preferences and beliefs (for example a preference for eating less meat leading to serving reduced amounts of meat to their families). Parents serving their children foods they themselves enjoy has previously been reported in the literature, and may encourage the child’s liking for these foods over time [22]. Thus, improving parental acceptance and willingness to prepare pork dishes may be an important strategy to improve pork consumption in children.

“To be honest I probably don’t always shop with the children in mind...often we’ll have pork if we have people over, because I think it’s not often, a lot of people don’t eat pork and we like it so we’ll cook with it, but for the kids we just tell them they’re eating it” (Group 1, male, mean child age 6.5 years)

Preparing and cooking pork

Parent’s perceptions that pork is acceptable to prepare

Overall, fresh pork was perceived to be an acceptable meat to prepare for feeding children and other members of the family. In terms of the convenience of cooking and the time involved to prepare pork, it was seen as being similar to other meats such as beef, although chicken was perceived to be the most convenient and easy meat to cook. The length of time associated with cooking a pork roast was discussed by several participants, although this was felt to be mitigated by the ease associated with cooking this dish.

“Cost and convenience for me. Um with a chicken breast I can turn it into anything, chicken, chicken wings can be cooked nice and easy in the oven and just baked, chicken legs same sort of deal, cooked in the oven, they can be served with any other type of, of meal, um usually ease, yeah they’re nicely packaged” (Group 2, male, mean child age 9 years)

Perception that pork needs to be cooked until “well-done”

Throughout the focus groups there was a strong perception amongst participants that fresh pork needed to be cooked until it was well-done, with a number of participants expressing concern about pink colour remaining in their pork when they had cooked it. A number of reasons for this concern were raised including a fear of food poisoning and a fear of contracting intestinal worms as a result of eating undercooked pork. Pork was perceived to be linked to a greater risk of food poisoning than meats such as beef or lamb, with the risk of food poisoning associated with undercooking pork perceived to be similar to the risk associated with consuming undercooked chicken.

"I do I make sure I cook it [pork] well because I know it can't um be pink like your beef, it's got to be cooked like you cook your chicken" (Group 1, female, mean child age 12)

Whilst there was an overriding belief that pork needed to be cooked until no pink colour remained amongst the groups, a small number of participants (approximately one per group) reported feeling comfortable serving pork that still had some pink colour. These participants discussed television cooking programs such as *Masterchef* as being instrumental in changing their perspectives, indicating that such programs can be effective mediums for translating this message, and resulting in behaviour change in consumers.

"yeah I always thought you shouldn't have it too, like it should be cooked, like you wouldn't want to have it medium rare or something but I saw on one of those cooking shows once that a slight pink is fine, and so that's made me be a lot more game um and its often then I think I used to cook it till it was just dried out, it was just had it, whereas now I protect it with rolling it in say cumin or something, um that helps and then just cooking it and I'm happy for it to be slightly pink" (Group 3, female, mean child age 13 years)

Lack of confidence or experience with cooking pork

A lack of confidence or experience in cooking pork was a common barrier to serving pork for children. Many participants felt that pork was not a meat they had had a lot of exposure to or experience in preparing, and as a result lacked confidence when cooking it for their families. Participants expressed fear regarding both under- and over-cooking pork, with the fear of it becoming dry and thus being rejected by children common amongst the groups. Pork medallions in particular were viewed as being very difficult to cook correctly, suggesting that this may be a priority cut to provide education regarding best cooking practices for parents to increase their confidence in preparing pork dishes.

"I think for me it's a bit of confidence, so with other dishes which I cook all the time, I don't even think about it, and I'm doing ten other things in my mind, whereas when it's something [like pork] it's like...I wanna make it appetizing, I want everyone to eat it, and you're suddenly going oh oh oh [worried noise]" (Group 6, female, mean child age 7 years)

"See I wouldn't pick up, when you say a medallion - I wouldn't pick like a piece of pork that, like if we're having it as our meat and veg meal, I would always pick up something with a bone in it because it's so much more forgiving to cook. Some sort of pork chop whether it's the rib or whether it's got like the T-bone or little bone in it, it's just, it stays, its heaps easier to, to not ruin, like a pork medallion" (Group 5, female, mean child age 4 years)

Need for pork recipes and cooking inspiration

During the focus groups many participants expressed a strong desire for new recipes as inspiration for new ways to cook pork for their children. Pork was perceived as often being presented with fewer options for preparation in supermarkets and butchers than other meats such as beef and chicken. Many participants also felt that, compared to other meats, they currently had fewer preparation ideas and recipes for pork, which negatively impacted upon their desire to serve it to their families.

When the moderator enquired about the type and format of recipes participants believed would encourage them to serve more pork, there was an overwhelming desire for fast, innovative recipes with appealing pictures. Time was a central factor for the appropriateness of these recipes, with elaborate recipes on television programs or celebrity chef cookbooks (for example Nigella Lawson)

perceived not to be feasible for working parents. Several participants also expressed a desire for inspiration on accompaniments to serve with pork, as they experienced greater difficulty in thinking of things to serve with pork than other meats.

“I’d say if the porks the, pork manufacturers want to encourage me to eat more pork, I probably need it to be presented in, these are all the different things you can do with pork, maybe ways that I haven’t thought about pork” (Group 6, female, mean child age 15 years)

“I’m always quite influenced by, you know, those kinds of little free recipe booklet things you get in the supermarket... You know just four or five pages and a few easy recipes, and I often try those kinds of things” (Group 5, female, mean child age 3.5 years).

Perception of boar taint

Sensitivity to androstenone, a key substance responsible for boar taint, has been found to vary between consumers, with females tending to be more sensitive than males [23]. A negative perception of the smell when cooking fresh pork was only referred to in one focus group, and only amongst female participants. For the participants that did notice a smell when cooking pork, it did not impact on their regular consumption of fresh pork; however they did describe strategies to overcome the issue when purchasing and preparing fresh pork. These included boiling the pork prior to cooking it further, and shopping at specialist butchers which they knew not to be associated with the smell.

“Um but the smell thing is a really [laughs], a really big thing for us too, and I, I’ve heard from my butcher that some places use pigs that are either on heat um and it changes the hormones when they’re slaughtered, so that you get a really pungent smell in the meat and everyone in my family can recognise it” (Group 5, female, mean child age 3 years).

Pork as part of tradition or culture

Family and cultural traditions were highlighted as having a large impact on the frequency and type of pork participants served to their families. The cultural background of participants and their partners strongly influenced their decisions to provide pork to their children, with participants of Asian heritage in particular citing cultural traditions as influencing their consumption of fresh pork. This finding is consistent with the patterns of pork consumption seen in the Pork CRC funded analysis of the 2007 Australian National Children's Nutrition and Physical Activity Survey (Nolan-Clark et al., 2013), where a higher proportion of children from an Asian background reported consuming fresh pork than those with a primary caregiver from Australia, Europe or the United Kingdom. A key finding was that participants from cultural backgrounds which traditionally consumed pork regularly reported consuming a larger amount of fresh pork overall. In addition to dishes traditional to their culture, these participants also reported consuming other pork dishes such as roast pork, suggesting that a cultural familiarity with some types of pork can result in improved perceptions of the meat as a whole.

“I guess it’s more cultural, we, pork is just a natural part of our household diet, and, I guess because of having Asian influence there, so it just comes in with all the rest of it as equal value” (Group 2, male, mean child age 5 years)

For participants without a cultural background associated with increased pork consumption, there was a strong link between fresh pork intake and special occasions. In particular, roast pork was specifically discussed as being a key element at Christmas, and, for some participants, birthdays. This tradition tended to be

based on the participant's own childhoods, and now formed part of the traditions they developed for their children.

"The Christmas thing resonated with me as well, growing up in Australia it was always, and I still have to do a roast pork in a couple of weeks' time [for Christmas], cos my father refuses to let go of it. Um but also we used to get it as a special treat on our birthdays, you could have a roast pork, a leg of pork on your birthday...it was primarily um for special occasions and stuff" (Group 1, female, mean child age 10.5 years)

"So I guess again with the roast pork it's sort of like a celebration, treat kind of meat rather than the, the staple in the house" (Group 6, female, mean child age 7 years)

Religion

Religion did not directly impact on pork consumption for the majority of participants, although the concept of avoiding pork products based on religion was discussed throughout the groups. Only two participants stated that they avoided serving pork to their children for religious reasons, with one of these participants only avoiding it when served at home.

"We don't bring pork to our home, um that's due to religious reasons, but we do eat bacon and pork um when we go out" (Group 3, female, mean child age 7 years)

Animal welfare and country of origin

Concerns related to animal welfare and country of origin were discussed by a small number of participants. Some discussed the negative publicity of pig farm conditions, and stated that their purchasing decisions had been impacted by such media campaigns on animal welfare. This finding is supported by Verbeke et al. [24], who found that animal welfare was a central element used by consumers when judging pig farming practices. Of interest for in the present study however was that while negative media campaigns could detrimentally impact upon purchasing decisions, participants felt that a similar platform could be used to educate consumers on positive animal practices implemented in the pork industry to improve perceptions and purchase intent.

"I really think it would be great if everywhere advertised, you know, how this food had been produced, I think that would be a good idea. I think you want the animal well looked after, you know, yeah" (Group 4, Female, mean child age 16 years)

Children's concern for animal welfare

Some participants also felt their children's willingness to consume pork was affected by their affection for pigs themselves. This appeared to be accentuated by the portrayal of pigs in popular children's television programs and movies, with participants specifically referring to *Peppa Pig*, *Charlotte's Web* and *Babe* as having a detrimental impact on their children's pork consumption.

"She loves pigs they're her favourite animal and if I've served something up and say to her that's, that's Babe you know, she will squeal and scream and hit the ground and have a meltdown, so I don't draw attention to the fact that it's a pig" (Group 3, Female, mean child age 11.5 years)

"There aren't any cow heroes are there?" (Group 3, female, man child age 15 years)

Country of origin

In relation to country of origin, participants expressed a preference for purchasing Australian pork, aligning with previous findings that consumers prefer meat produced in their current country [3]. However, participants reported not

checking the country of origin when purchasing pork, with many participants stating that they made the assumption that all pork (both fresh and processed) was of Australian origin.

“I’ve never thought about or looked at country of origin as I always assumed it was from here” (Group 3, Female, mean child age 15 years)

Ensuring that participants are aware that of the possibility that processed pork products may be imported from other countries may ensure that consumers pay more attention to the country of origin of such products and preferentially select processed pork products of Australian origin.

Pork availability and awareness

Lack of visibility of pork

A large proportion of participants viewed pork as being less visible in shopping outlets than other meats such as beef and chicken. Many participants expressed the view that the space allocated to fresh pork in supermarkets or delicatessens was much smaller than that allocated to other meats, which they felt discouraged them from purchasing it for their children. Participants also reported occasionally missing fresh pork in the supermarket, due to it being presented in a slightly different location to the other meats in some outlets. Participants strongly felt that this lack of visibility impaired their likelihood of serving pork to their children, as they simply would not see it in a supermarket. This finding is in contrast to the results of European research suggesting consumers perceive pork to be accessible [2], suggesting that pork placement in Australian food outlets may require reassessment.

Similarly, participants also referred to a lack of visibility of pork on menus at restaurants and fast food chains. Of particular relevance to children, it was perceived that pork tended not to appear on children’s menus or in meals for children at fast food outlets, limiting children’s access to pork in a setting outside of the home.

“I think in supermarkets as well there’s, you go in there’s a massive say beef or chicken section, and pork is, sometimes you’ve got to hunt for it” (Group 1, male, mean child age 6.5 years)

“It’s like beef, lamb and chicken, and even turkey are all in one fridge, and then there’s a gap and then, there’s a little fridge and pork’s in there, so I’d probably, I would never look, and if I was comparing next to each other, they’re not actually next to each other presented to me, so I probably don’t look for it every week to go for a shop, because of it being in there” (Group 6, female, mean child age 7 years)

“If you look at kiddies menus at places like clubs, it’s chicken nuggets and pizza, and fish and chips. But it’s never pork...” (Group 2, male, mean child age 5 years)

Lack of access to a variety of pork cuts

Participants felt that compared to other meats such as beef, there was a limited variety of pork cuts available in food outlets. This observation was discussed as having a detrimental impact on their perception of the versatility of pork, and thus, on the likelihood that they would purchase it for their families. Available cuts of pork in supermarkets were felt to be limited to pork chops and pork roasts by several participants, suggesting that either a limited variety of pork is available, or that participants are not able to identify other cuts of pork.

“But when you go shopping there’s only just so many different ways you know that they sell it, like you get the medallions or you get the pork chops or you get the

roast pork or you get the mince, there isn't really anything else" (Group 1, female, mean child age 6.25 years)

Awareness of pork in the media

Advertising campaigns were discussed by a number of participants. Most participants recalled the 'Get Some Pork on Your Fork' campaign by Australian Pork Limited and several referred to it as coming to mind when they thought of purchasing pork. Participants felt however that pork was not advertised as heavily as beef or chicken and believed that additional exposure regarding cooking strategies for pork would encourage them to purchase it for their children.

"I must say one thing comes to mind I hear pork and for some reason that ad I don't even know if it's still on, but that get some pork on your fork, that one stuck in my head, yeah I don't know if it's on tv any more but that gets me every time" (Group 3, female, mean child age 3.75 years)

Television cooking programs such as *Masterchef* have been reported to influence purchasing behavior [25]. Participants also discussed that television cooking programs (including *My Kitchen Rules* and *Masterchef*) may influence their decision to purchase, as well as their children's willingness to eat products featured on the program. Such programs were repeatedly referred to as a source of cooking information throughout the focus groups, and many participants felt they would purchase more pork for their children if it was featured on a television program. This was due to the perception that it would provide them with new ideas on how to prepare pork, as well as increasing their familiarity with pork as a meat.

"If I saw it on one of the big shows, yeah I'd definitely go out and buy it then. And if it tasted good, which it usually does when you see it on tv it looks like it's going to taste nice, and then in your head it tastes nice, then it'd probably appear on the menu for a while" (Group 2, male, mean child age 9 years)

Cost of pork

There was a range of responses in relation to the cost of pork products. Many participants expressed that they felt that pork was more expensive than other meat varieties such as chicken. The perception that chicken is less expensive than pork mirrors findings from consumer research based in Ireland and may significantly impact purchasing behaviour in relation to pork products (McCarthy et al. 2004). However the cost of meat in general was a concern reported for many group participants. There was also a perception amongst several group members that pork sausages and mince were more expensive than their beef counterparts. Several group members also reported substituting meats they felt were cheaper into recipes that would have traditionally been made with pork to reduce meal costs.

"The price would have to drop, um for me to buy pork regularly. At the moment, if I'm looking at the supermarket shelf, I really won't scan out pork or seek out pork products unless there's some glaring thing jumping out at me saying 'hey, it's this price' because I just know that it's gonna be generally dearer than what I'll budget for for a meal..."

"...The thing that'll stop me buying the ingredients is if I know they're too, too pricey, and that's what generally stops me with pork, is that oh it's got pork in it, do I need pork, can I go with something else instead?"

(Group 2, male, mean child age 9 years)

To overcome the issue of the higher perceived cost of pork, several participants reported buying pork products in bulk when discounted and storing it in the freezer for later use.

"I tend to buy in bulk when it's on special, I'll buy, and then I have a big deep freeze, so I'll just, you know, if the roasts are on special I'll grab a couple, if the chops are on special I'll grab a few and just try to minimize it that way, but I don't think it's just pork, I think it's the whole meat industry's expensive"
(Group 1, male, mean child age 16 years)

The perception that pork was expensive to purchase when eating out in comparison to other meats was also discussed as a potential barrier to intake by several group members, with particular reference to the high perceived cost of dishes such as pork belly and pork ribs. In contrast, a smaller proportion of participants reported that they were either not aware of a difference in cost between pork or other meats, or that pork was cheaper than some other meat varieties, such as lamb.

"it's cheaper than lamb these days, I mean because I, I got brought up in lamb, everything was lamb, every bloody night was lamb chops and I was so sick of lamb chops and now I'd give anything for lamb chops because they're so expensive. So I mean pork isn't as expensive as lamb so we will buy it more often for exactly that reason..." (Group 1, female, mean child age 4 years)

"Yeah I think price wise you kind of go chicken, beef, pork, lamb"

(Group 5, female, mean child age 15 years)

Parent's perceptions of the healthfulness of pork

Overall the general perception of participants was that fresh pork was a healthy meat. The perception of fresh pork fillets in particular as a lean meat was discussed by participants, with several suggesting that they perceived fresh pork fillets to be leaner than beef due to the absence of the fat marbling seen in some beef cuts and the presence of a small amount of fat that could be easily removed prior to consumption. The most recent nutrition composition analysis of Australian fresh pork supports the perception that it is a lean meat product [26].

Several participants commented that the healthfulness of pork was subject to the cut selected and the cooking/preparation strategy selected. Several participants discussed avoiding particular pork items such as pork belly and ribs due to their perceived higher fat content.

"yeah, it's, you can go either way, can't you, yeah, from your sort of layer fat pork belly and that sort of stuff and your pork ribs, that's another one that I like, pork ribs [laughs] um, but um yeah also just, yeah, it can be quite lean....but like with bacon, you can cut that off and that sort of thing so it can be as healthy or as unhealthy as you choose to be, depending on..."(Group 4, female, mean child age 5 years)

There was also a consistent perception amongst participants that pork has become leaner than in previous years. This is consistent with breeding practice targets of the Australian Pork Industry [27].

"...I think pork in Australia, I've noticed over the last 30 odd years or so that pork in Australia is a lot leaner than it used to be, when I was a kid there was always a good 3cm of fat on a pork then, now it's you know it's quite thin, they seem to be breeding them a lot, especially if you go for um you know the free range porks and, they're allowed to run around in the paddock and that, they seems to be much leaner meat than they used to be, it's um, I think that's kind of made it a bit easier to, to not be as concerned about it.." (Group 1, female, mean child age 10.5 years)

In contrast, several participants discussed concerns relating to the high sodium and/or fat content of processed pork products including ham, bacon and cured

pork products. Many participants felt that processed pork products were less healthy than their fresh pork counterparts. Several participants reported that they were not concerned with the healthfulness of pork products as they did not form a staple part of their (or their children's diet).

A key theme identified in relation to the healthfulness of pork was that consumers were unaware of the health advantage of selecting pork over other meat varieties. A need for more information on the unique nutritional benefits of pork was clearly articulated within the groups. In particular, concerns about pork products providing less iron than either beef or lamb were stated as reasons why pork was not consumed as readily. Pork was also repeatedly referred to as a white meat by group participants, suggesting that consumers may require clarification on this issue.

"I think the other thing that might help in terms of purchasing pork and that sort of thing is, is maybe knowing more of the health benefits...I think um, when I think of why do we include meat in our meals, is for the protein and that sort of thing and I will tend to go out of my way to buy beef and lamb, because I know that they're good sources of iron, whereas, I actually don't know [laughs] um, like why I, I'd specially go for pork and that could just be ignorance on my behalf, but, um, other than that it tastes good, that would be the choice factor" (Group 4, female, mean child age 5 years)

"...I think of beef being high in iron cos it's bright red, and I think, well if I'm going to have a white meat, I'm gonna have chicken, so it's like I don't need to have it in my diet, kind of thing. I don't know what I am getting from it that I can't get from here or here and when you're trying to feed a kid and you know they eat here and here, well you're like, why would I present that?" (Group 6, female, mean child age 7)

"I think it might be worthwhile for them to, to you know, educate consumers on what might be the benefit of pork.... so what would be the benefit of having pork in my diet? And I think they've gotta sell me on that, for me to have it in my diet" (Group 6, female, mean child age 7)

Perceptions of processed pork

Processed pork as a convenience food

Processed pork was discussed by many group participants as an easy and convenient food that was well accepted by their children. Processed pork items such as bacon and ham in particular were discussed as versatile additions to meals that were easy to prepare when time was poor. Frequently mentioned examples of how processed pork was incorporated into the children's diet included bacon and egg muffins, omelettes containing bacon, bacon as part of a breakfast dish or added to pasta dishes and ham on sandwiches.

"I think it's quick and easy like sometimes if I don't, um if I come home late from work or if I haven't planned out what I'm cooking that night, my kids and husband will be like 'mum eggs and bacon rolls', you know they love that and we'll have that for dinner if we're just all tired or have come back from town, had an appointment or whatever, um and they love having that Sunday breakfast, sleeping in and then waking up to eggs and bacon, and sometimes even when we're out....they'll choose to have, it's lunchtime but they'll choose to have a breakfast meal because they love bacon and ham and eggs and all that" (Group 1, female, mean child age 12 years)

"Ours is definitely convenience, we've always got bacon in the fridge, bacon sandwiches, pasta, you can just, you can do so much with it"

(Group 1, male, mean child age 6.5 years)

A greater confidence in their ability to prepare processed pork meals when compared to their fresh pork counterparts was also discussed by several group members. Processed pork was discussed as being easy to cook (if required) and as such more readily prepared by parents or carers.

“I think there’s probably more confidence associated with those foods, so ham you don’t even have to cook, you might put it on a sandwich, and like bacon, I’m pretty confident in cooking my bacon, ahh so compared to, say a pork steak, so I guess it’s you know the versatility” (Group 6, female, mean child age 7 years)

Children’s preference for processed pork products

Overall many participants reported that their children preferred processed pork over fresh pork products. This may be due to the familiarity of such items if they are offered more frequently by parents for the reasons of convenience and versatility discussed above. Birch and Marlin [28] identified that preferences for particular foods are proportional to the number of exposures to that particular food. Ensuring that parents or carers are confident with the preparation of fresh pork, in addition to educating them about recipes involving fresh pork may increase the frequency with which children are presented with fresh pork and thus increase their acceptance of this type of pork. This may be particularly important as food preferences developed during childhood are frequently maintained throughout adult years [29-31].

“I think it would be bacon, absolutely hands down bacon sandwich, he’d eat that every day if he could...” (Group 1, male, mean child age 6.5 years)

Several participants reported that they were actively limiting their child’s intake of processed pork products due to concerns about the sodium and fat content.

“We rarely eat bacon, very rarely, maybe once a month but the kids like it, love it, but because I think the high content of salt, and yeah the fatty bits on it we just we don’t have it very often, yeah” (Group 3, female, mean child age 16 years)

Parent’s not associating processed pork products (such as bacon) as a type of pork

Of interest, many participants discussed that they did not immediately consider processed pork such as ham and bacon when discussing their pork preferences. Many participants asked for clarification as to whether ham for example should be discussed in this context, suggesting that the immediate perception of many individuals when asked about pork was to think only of fresh pork products.

“I think people see pork as a roast or a pork chop, that’s about it. And yeah...., it’s that, as you forget about bacon, you forget about ham. So I think um, when people actually sit back and think about it they probably eat a little bit more pork than they actually realise...” (Group 2, male, mean child age 14 years)

“Sitting here talking about it I was thinking of butterflied pork, something like that or pork chops but not the cold products, and I love the cold products...” (Group 2, male, mean child age 9 years)

Children’s fresh pork preferences

When considering fresh pork, many participants reported that their children preferred dishes where pork was presented as part of a mixed dish such as a curry or stir fry rather than as a single piece of meat. The exception to this was for roast pork, with several parents reporting that their children enjoyed pork prepared in this way with crackling (particularly if served with a sauce or marinade). Marinades and sauces were also discussed as ways to increase the acceptability of fresh pork dishes such as ribs.

“Where if you cook it with a stir-fry, and it’s, it’s all mixed in with the vegetables, not a problem, just eat it like that, or mince, minced meat, not a problem, with a sauce, with vegetables and things, yeah, doesn’t seem to be a problem, but when it’s a big piece of meat, seems to be a bit more um, troublesome, when they’re younger..” (Group 4, female, mean child age 16 years)

Involving children in the preparation of dishes containing fresh pork such as pork dumplings or meat balls was identified as a strategy used by parents/careers to improve the acceptance of these meals.

“...I think both of them, but at least my son, again, the idea of making meatballs, together with my wife, you know, doing it physically, and ah making the meatballs with pork mince and beef mince and, and he gets a lot of joy out of that...” (Group 4, male, mean child age 5.5 years)

Similarly, dishes which require children to use their hands to consume fresh pork were discussed as a strategy to encourage intake of pork by several participants.

“Actually the san choy bow went down really well with my daughter as well, I think it was the novelty of having the lettuce cups and things like that as well”

“Yeah I must say fun foods seems to work with our guys at the moment, I often do pork mince in tacos in things like that and because the kids are allowed to eat with their hands they absolutely love it, makes a big mess...” (Group 3, female, mean child age 3 years)

Increasing the engagement of children in the preparation of meals has been found to increase their acceptance of a variety of healthful foods [32]. Similarly providing meals which are considered fun to consume by children may create an environment where dishes are more readily accepted and therefore increase intakes of foods offered in this way.

Overall children’s preferences for dishes containing pork mince, pork items that could be served as finger foods and those involving sauces or other ingredients to flavour pork was identified by participants. A summary of the fresh pork dishes reported as being accepted by children is provided in Table 4. Their children’s preference for pork chops and pork served with a bone was identified for a minority of participants, but this preference was not shared by the majority of the group.

Table 4. Fresh pork dishes reported as being preferred by children in particular

- Pork sausages
- Pork dumplings
- Pork schnitzel
- San choy bow with pork mince
- Pork mince tacos
- Pork mince meatballs
- Pork mince bolognaise
- Pork mince lasagne
- Pork stir fry
- Sausage rolls made with pork mince
- Sweet and sour pork
- Pork spring rolls
- Roast pork & crackling (with plum/apple sauce)
- Marinated pork ribs
- Pork chops or marinated barbecue pork

Barriers to children's pork consumption

Fussy eating behaviour in children

Fussy eating was discussed as a common barrier to feeding a variety of foods to children, including fresh pork. Many participants expressed frustration when trying to serve new dishes to their children, and referred to frequent experiences with children rejecting foods. Participants stated that they often modified their feeding practices as a result of their children's restrictive eating behaviour, and would primarily serve foods that they knew their children would eat (such as chicken dishes) to ensure harmony at the dinner table. While fresh pork was not highlighted as being commonly rejected by most children, it was considered to be less acceptable than chicken, which parents expressed confidence in their children eating.

"We'll actually cook a little bit of pork for ourselves and then we'll cook the kids something else because we just know they don't like it, they don't enjoy it, um so we don't even bother trying these days, we have tried but wasn't successful" (Group 2, male, mean child age 5 years)

"And so I'm just like, well I'm just gonna give her chicken, mashed potato, peas and corn and carrots and I know she is gonna sit and eat all that and then it's my peace and quiet and I know, you know I should get her to try different things, but sometimes it's just simpler not to" (Group 6, female, mean child age 7 years)

Children's perception of pork as a fatty meat

Several participants discussed their children's perceptions of fresh pork as a fatty meat, which acted as a barrier to their willingness to eat it. This tended to be discussed more in parents of older children aged approximately 12 years and above, and was often associated with an increased interest in health and nutrition in these children. A small number of participants with younger children discussed their children's aversion to a fatty flavour, which they perceived to be associated with pork. The consumer perception of pork as a fatty meat has previously been described by Verbeke and Viaene [6], however other research has reported pork to be considered less fatty than beef and lamb [3], suggesting confusion on this topic exists. There may thus be scope for educating consumers on the fat content of pork relative to other meats.

"I think my kids...they see pork as a, a fatty meat, and that's one thing they don't like about eating meat" (Group 2, male, mean child age 14 years)

Texture of fresh pork

The texture of fresh pork was viewed as being a potential barrier to consumption in younger children, although this issue was alleviated in later childhood years. Texture was primarily considered to be an issue in the event that the pork had been overcooked and become dry, with pork chops and steaks viewed as being the cuts most likely to be rejected due to texture. In contrast, roast pork and dishes made with pork mince were seen as having an acceptable texture for children.

"We've got a three year old and chicken is much easier for them to eat and chew on than red meat and pork if it's, if it's a chop or something, they don't seem to like it that much" (Group 2, male, mean child age 5 years)

"We don't have separate meals from the kids, just whatever is cooked is what we all eat, so to just make it a bit more child friendly, yeah, having...the roasted sort of stuff, cuts of meat or mince, um, just makes it a bit easier" (Group 4, female, mean child age 5 years)

Children's inability to differentiate between meat types

For participants with younger children aged under five or six years, a prevalent discussion point was the inability of their children to differentiate between different meat types. In particular, children had a tendency to describe all meats as 'chicken', and some participants described this tendency as a method for them to trick their children into eating different types of meat, including fresh pork. Whilst this may be a successful strategy for increasing pork intake in the short-term, it may have detrimental implications on these children's long-term pork consumption. Research suggests that the development of children's food preferences are highly dependent on the foods they are regularly exposed to [33], therefore the practice of not clearly identifying fresh pork in meals may limit children's acceptance of it in later years.

"But then, pork chops...they make no distinction, well my four year old makes no distinction between lamb chops, pork chops, steak, they are all just the same thing, he makes no distinction." (Group 5, female, mean child age 4 years)

Flavour preferences

The importance of flavour when presenting meals to children was frequently discussed in the focus groups. Participants felt that their children's acceptance of fresh pork was heavily dependent on their acceptance of the flavour, with a common view being that children would reject a dish if they did not enjoy the taste. Flavour preferences discussed appeared to vary greatly between children, as has been reported previously [34]; however the accompaniment of fresh pork with Asian-based cuisines was described favourably, whilst a perception of fatty tastes associated with fresh pork impeded pork consumption, as described above.

"Flavour goes through my head, the first thing. If they don't like the flavour of it they're not gonna, going to touch it, so however it gets, gets prepared has to be full of, full of flavour" (Group 2, male, mean child age 9 years)

Parent's perception of value added pork products

Positive perceptions of value added pork products

Several group participants perceived value added pork products to be visually pleasing and an acceptable way to purchase fresh pork.

"I bought one and there were circles of pork, pork medallions, but they're big with a little thing of butter on top, they are unbelievable fabulous, and my kids, when, I've only bought them a couple of times and my sons just they just fall over themselves when they see them..." (Group 3, female, mean child age 15 years)

The convenience of value added pork products was the main reason why participants reported purchasing these items. Value added pork products seem to appeal to those that may be time poor or unprepared for events such as barbecues where they may be required to bring some meat.

"I think those things are a convenience thing, they're just there just to have just something in the freezer that you can grab quickly or, oh geeze I'm going to a barbeque, I haven't got any meat, duck into Woollies, oh there's something already marinated, little beauty, chuck it on the barbie when I get there, so. I think they're more of a convenience thing than anything" (Group 2, male, mean child age 14 years)

Fresh pork products that were not marinated, but pre-sliced (such as stir-fry pork strips) were also seen as acceptable by several group members, who discussed these items as reducing the time taken to prepare meals.

"yep if they've been chopped for me, partly because I don't like having to deal with the meat, um so if it's done and I don't have to chop it myself, it can just

kind of get tipped straight in, but it also saves a little bit of time when you've got three kids hanging off your legs trying to cook something" (Group 3, female, mean child age 3 years)

Negative perceptions of value added pork products

Many participants had some negative perceptions relating to pre-packaged value-added pork products. In particular, several participants discussed having tried other value added meat varieties such as beef and being disappointed with the quality of the product as having a negative influence on their perception of these products.

"...I think I've been burnt to many twice, too many times with buying meat that's pre-packaged like that and you think, ohhh, this is tough and there's, now there's a huge lump of gristle and now there's, you know it's just not that great yeah"(Group 5, female, mean child age 15 years)

Some participants reported that they assumed such products to contain a large amount of preservatives or to be high in salt. This was particularly the case for products that were pre-marinated. The issue of not knowing what was in marinades was also of concern for many individuals who reported issues with food intolerances (such as gluten).

"They would appeal to me but the first thing I would do was see if they had preservatives, and if they did I wouldn't buy them"

(Group 5, female, mean child age 14 years)

"I'm the same, I, I don't think we'd ever buy those because of the, all the additives in them, yeah, that's the simple reason" (Group 2, male, mean child age 5 years)

Pre-marinated pork products were also widely thought by group members to be hiding poorer cuts of meat, with many citing unfavourable past experiences when they had purchased pre-marinated products in the past as the reason for this perception. Several participants discussed a preference for the marinade and meat to be provided separately in a pre-prepared meal to ensure that the meat quality could be clearly seen.

".... I think it's an old, an old thing, it's probably up there with some older rumours that used to go around, when I was a kid that you didn't order the, the pork cutlet, the crumbed cutlets from the butcher because he'd used to use the seconds, because you couldn't see what was inside the crumb, sort of thing, um so it's probably a bit of a hangover from that aspect....but I'd be sort of, um cautious of what, the quality of it, what could be lurking underneath the marinade as well" (Group 1, female, mean child age 10.5 years)

"I've bought the lamb version of the marinated stuff, thinking oh wow, and when I actually went to cook it, it was really fatty, really really fatty. I didn't, you couldn't see it through the packaging, you had all this beautiful sauce all over it, and you cook it and it's like ok, and that's made me literally distrust the pre-packaged stuff. I'd rather have the sauce in, in a sealed pack on its side and see the meat, so I can actually see, see the meat, than them both mixed together, and then I can marinate it at my, my leisure" (Group 2, male, mean child age 9 years)

Another key factor relating to the acceptance of marinated value-added pork products in particular was the participant's perception of the flavour. Several participants stated that the flavour combinations were unfamiliar to them or that they would prefer to prepare their own marinade using flavour combinations that they knew would be enjoyed.

“I wouldn’t purchase them ever, I don’t like pre-marinated stuff. Um because I don’t know what the flavour is, so I don’t want to waste my money on something which I don’t know the flavour of, so I would get, I would, might get something similar to that and then I would marinate it myself, but I would never buy probably a pre-marinated thing, cos I would hate to waste my money not knowing what it tastes like” (Group 6, female, mean child age 7 years)

Cost of value added pork products

In general most participants viewed the cost of value-added pork products as being too high to offer them to their families on a regular basis. This was particularly the case for larger families who felt they would need to purchase more than one package to feed their families comfortably. Many parents with several children at home felt that the size of value added pork products were too small, resulting in them having to buy several packages at a higher perceived cost.

In contrast, parents of younger children reported that the individually portioned pieces of meat (for example 2 pre-marinated chops) were too large for their needs. Engaging with supermarkets to provide visually appealing value added pork products that can be selected based on volumes required in a deli-style setting may help to address this potential barrier for individuals seeking to purchase pork in this way.

“yeah I’ve bought the ones where there are two and so I’d need to buy two packets, so that makes it quite expensive, cos we will have one each, so yeah regardless of how much of it you eat it’s quite a large amount of money to spend” (Group 3, female, mean child age 15 years)

Many participants discussed the possibility that they would feel more comfortable in trialling value-added pork products if they were reduced in price, with several reporting that they had tried such products during periods of discounting. Some participants reported purchasing several value-added pork products when on sale and storing in the freezer for later use as a convenient meal option.

“...It’s nice when it’s reduced because you can then be a bit more adventurous and try something you haven’t tried before um when it’s the full price I think I’ll go for something I know, or that I know I can cook” (Group 3, female, mean child age 15 years)

“....They’re too expensive for me to buy to feed my family, at the price that they sell for, but I would buy them if they were being got rid of”

(Group 3, female, mean child age 16 years)

Following thorough qualitative analysis a number of key themes emerged from the focus groups in relation to fresh pork intake, namely: a lack of confidence and knowledge relating to the preparation and cooking of fresh pork; poor acceptability of fresh pork by some children due to taste and texture; influence of family and cultural traditions on pork consumption; low visibility and perceived availability of pork in comparison to other meats; and a perceived high cost of value-added pork products. The identification of key themes and barriers to pork intake by children may assist in the development of targeted marketing strategies to improve pork consumption in the diets of Australian children. Exposure to foods in early childhood contributes to lifelong eating habits, therefore ways in which to overcome the identified barriers could position fresh pork more prominently in the meal repertoire of Australian families and future generations.

4. Application of Research

This research has provided some important insights into potential barriers for intake of fresh pork in particular by Australian children. As a result of the in-depth thematic analysis, several potential opportunities to improve the acceptability of fresh pork in the diets of children were identified as outlined below:

- The need to provide parents with time efficient, convenient recipes for fresh pork dishes that would be readily accepted by their children was identified
- When considering recipes to provide to parents, well accepted dishes appeared to be those that require engagement with children (eg. Those that children can assist in the preparation of and those that can be eaten with fingers - such as san choy bow, pork dumplings and pork meat balls or other dishes where pork served as part of a mixed dish such as a stir fry)
- The lack of perceived visibility of pork in comparison to other meat types, particularly at the point-of-sale in large supermarkets, suggests that there may be scope to engage parents with pork preparation and cooking strategies through media such as television or the use of a highly visible brand ambassador at point of purchase. Advice addressing the perception that pork must be cooked until well done (over cooked) may also help acceptability of pork-containing dishes to children, who may have otherwise disliked the texture.
- The need for education regarding the unique nutrition benefits of pork meat was highlighted as an important opportunity to encourage parents to purchase pork for their children. Such information provided in conjunction with recipes and appropriate cooking methods may greatly improve knowledge and confidence in this area, potentially translating to increased fresh pork intakes.
- Whilst value added pork products may offer a convenient option for parents, there is an important opportunity to improve perceptions of these products by either promoting that they do not use poorer cuts of meat, or alternatively providing marinades separately to meat to overcome the perception that marinades may be hiding fatty cuts. In addition, providing opportunities for parents/carers to select value added products based on their individual portion size requirements (in a deli style setting), may facilitate greater purchasing of such products.

5. Commercialization/Adoption Strategies

This research has provided key insights into consumer behavior in relation to the inclusion of pork in the diets of Australian children and within the meal repertoire of parents. The opportunities identified as a result of this research may facilitate new approaches in relation to the marketing of fresh pork to parents of Australian children which may lead to increased intakes. This research has identified many opportunities to overcome some of the barriers associated with fresh pork consumption in children that may have been previously unknown.

6. Conclusion

Completion of in-depth focus groups involving the parents/carers of children have identified several key themes in relation to pork consumption practices. Overall fresh pork was considered to be a healthy meat option for parents to provide to their children. However, a need for convenient and fast recipes for pork was discussed, with options for finger food style dishes considered most likely to appeal to children. A lack of visibility of pork in contrast to other meats was perceived, with a need to engage with media and cooking programs to improve awareness of pork discussed. A need for more information regarding both the unique nutrition characteristics of pork and appropriate cooking methods was also identified. Value added fresh pork products were perceived to be convenient, however the cost and current portion size options were discussed as barriers to intake. Findings from this research may provide important insights to drive marketing strategies to increase the intake of fresh pork amongst Australian children. As exposure to foods throughout childhood assist in the formation of eating habits throughout later life, adapting marketing practices to address the barriers identified may have favourable long term consequences for the Australian pork industry.

7. Limitations/Risks

Some limitations of this research should be considered when applying the findings:

- As the purpose of focus groups is to obtain an in-depth understanding of a topic of interest in a select number of individuals, it is not feasible for focus group research to be representative of all consumers' perceptions. Therefore, it is possible that the perspectives raised do not reflect that of all consumers. However, the consistency in responses discussed between groups suggests that these perceptions were common amongst a number of consumers. In addition the saturation of themes discussed occurred during the 4th focus group, with no new themes emerging in the subsequent two groups, suggesting that a thorough understanding of consumer perceptions had been obtained.
- While efforts were made to recruit participants from a range of education and work backgrounds (by including employees of a local university and recruiting at a shopping centre), there was a higher proportion of participants with a university education than the Australian average [35], which may impact on the representativeness of the views raised in the groups. It is important to note however, that there was no difference in the proportion of participants with a university education between those participants recruited at the shopping centre and the university, suggesting that recruitment strategies were not responsible for this finding. It may be helpful to purposefully sample individuals with lower levels of education and varying socioeconomic status, as well as in groups of culturally and linguistic (CALD) sectors of the population to determine whether views expressed differed from those reported.

8. Recommendations

As a result of the outcomes in this study the following recommendations have been made:

- Increase the visibility of pork products through point of sale ambassadors and media engagement
- Educate consumers regarding the unique nutrition profile of pork, with a particular focus on the benefits of consuming pork over other meat varieties
- Provide readily accessible recipes that are fast and convenient to prepare for children (examples provided throughout report) and that are consumer-tested in the target age group
- Consider future research (such as a survey) to determine whether salient themes identified are representative of a larger proportion of the Australian population

9. References

1. Nolan-Clark, D.J., E.P. Neale, and K.E. Charlton, *Processed pork is the most frequently consumed type of pork in a survey of Australian children. Nutrition Research*, 2013. 33(11): p. 913-921.
2. Bryhni, E.A., et al., *Consumer perceptions of pork in Denmark, Norway and Sweden. Food Quality and Preference*, 2002. 13(5): p. 257-266.
3. Ngapo, T.M., et al., *Consumer perceptions: pork and pig production. insights from France, England, Sweden and Denmark. Meat Science*, 2003. 66(1): p. 125-134.
4. McCarthy, M., et al., *Factors influencing consumption of pork and poultry in the Irish market. Appetite*, 2004. 43(1): p. 19-28.
5. Bredahl, L. and C. Poulsen, *Perceptions of pork and modern pig breeding among Danish consumers. The Aarhus School of Business*, 2002. Project paper no. 01/02.
6. Verbeke, W. and J. Viaene, *Beliefs, attitude and behaviour towards fresh meat consumption in Belgium: empirical evidence from a consumer survey. Food Quality and Preference*, 1999. 10(6): p. 437-445.
7. Pieniak, Z., et al., *Fish consumption and its motives in households with versus without self-reported medical history of CVD: A consumer survey from five European countries. BMC Public Health*, 2008. 8.
8. Kitzinger, J., *THE METHODOLOGY OF FOCUS GROUPS - THE IMPORTANCE OF INTERACTION BETWEEN RESEARCH PARTICIPANTS. Sociology of Health & Illness*, 1994. 16(1): p. 103-121.
9. Kitzinger, J., *QUALITATIVE RESEARCH - INTRODUCING FOCUS GROUPS. British Medical Journal*, 1995. 311(7000): p. 299-302.
10. Wong, L.P., *Focus group discussion: a tool for health and medical research. Singapore Medical Journal*, 2008. 49(3): p. 256-260.
11. Krueger, R. and M. Casey, *Focus groups: a practical guide for applied research. 3rd ed. 2000, California: Sage Publications Inc.*
12. Ritchie, J., J. Lewis, and G. O'Connor, *Analysis: Practices, Principles*

and Processes, in *Qualitative Research Practice: A Guide for Social Science Students and Researchers*, J. Ritchie and J. Lewis, Editors. 2003, Sage: London.

13. Ritchie, J. and L. Spencer, *Qualitative data analysis for applied policy research*, in *Analyzing qualitative data* A. Byman and R. Burgess, Editors. 1994, Routledge: London. p. 173 - 195.
14. Yardley, L., et al., *Older people's views of falls-prevention interventions in six European countries*. *Gerontologist*, 2006. 46(5): p. 650-660.
15. Burt, J., et al., *Nursing the dying within a generalist caseload: A focus group study of district nurses*. *International Journal of Nursing Studies*, 2008. 45(10): p. 1470-1478.
16. Jefferies, H. and C. Clifford, *Aloneness: the lived experience of women with cancer of the vulva*. *European Journal of Cancer Care*, 2011. 20(6): p. 738-746.
17. Miller, N., et al., *Living with foreign accent syndrome: Insider perspectives*. *Aphasiology*, 2011. 25(9): p. 1053-1068.
18. Murtagh, J., R. Dixey, and M. Rudolf, *A qualitative investigation into the levers and barriers to weight loss in children: opinions of obese children*. *Archives of Disease in Childhood*, 2006. 91(11): p. 920-923.
19. Walker, O., et al., *A qualitative study of primary care clinicians' views of treating childhood obesity*. *Bmc Family Practice*, 2007. 8.
20. Webber, L., L. Cooke, and J. Wardle, *Maternal perception of the causes and consequences of sibling differences in eating behaviour*. *European Journal of Clinical Nutrition*, 2010. 64(11): p. 1316-1322.
21. Wood, F., et al., *A Question of Balance: A Qualitative Study of Mothers' Interpretations of Dietary Recommendations*. *Annals of Family Medicine*, 2010. 8(1): p. 51-57.
22. Birch, L.L. and J.O. Fisher, *Development of eating behaviors among children and adolescents*. *Pediatrics*, 1998. 101(3): p. 539-549.
23. Lundstrom, K., K.R. Matthews, and J.E. Haugen, *Pig meat quality from entire males*. *Animal*, 2009. 3(11): p. 1497-1507.
24. Verbeke, W., et al., *European citizen and consumer attitudes and preferences regarding beef and pork*. *Meat Science*, 2010. 84(2): p. 284-292.
25. Sinclair, L., *Masterchef sparks Coles sales splurge*, in *The Australian*. 2010.
26. Greenfield, H., et al., *Nutrient composition of Australian retail pork cuts 2005/2006*. *Food Chemistry*, 2009. 117(4): p. 721-730.
27. Dunshea, F.R., et al., *Effects of dietary factors and other metabolic modifiers on quality and nutritional value of meat*. *Meat Science*, 2005. 71(1): p. 8-38.
28. Birch, L.L. and D.W. Marlin, *I don't like it; I never tried it: Effects of exposure on two-year-old children's food preferences* *Appetite*, 1982. 3(4): p. 353-360.
29. Kelder, S.H., et al., *Longitudinal tracking of adolescent smoking, physical activity, and food choice behaviors*. *American Journal of Public Health*, 1994. 84(7): p. 1121-1126.
30. Puhl, R.M. and M.B. Schwartz, *If you are good you can have a cookie: How memories of childhood food rules link to adult eating behaviors*. *Eating Behaviors*, 2003. 4(3): p. 283-293.

31. Mikkila, V., et al., *Longitudinal changes in diet from childhood into adulthood with respect to risk of cardiovascular diseases: The Cardiovascular Risk in Young Finns Study*. *Eur J Clin Nutr*, 2004. 58(7): p. 1038-1045.
32. Larson, N.I., et al., *Food preparation and purchasing roles among adolescents: Associations with sociodemographic characteristics and diet quality*. *Journal of the American Dietetic Association*, 2006. 106(2): p. 211-218.
33. Patrick, H. and T.A. Nicklas, *A review of family and social determinants of children's eating patterns and diet quality*. *Journal of the American College of Nutrition*, 2005. 24(2): p. 83-92.
34. Wardle, J. and L. Cooke, *Genetic and environmental determinants of children's food preferences*. *British Journal of Nutrition*, 2008. 99: p. S15-S21.
35. Australian Bureau of Statistics, 6227.0 - *Education and Work, Australia*, May 2013. 2013: Canberra.