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# Young Chinese and Functional Foods for Mobility Health: Perceptions of Importance, Trust, and Willingness to Purchase and Pay a Premium

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## ABSTRACT

Consumers' desire to enhance diet and health has become a driver for the development of functional food products. China, with one of the largest markets in the world, offers huge potential for these foods. In the context of functional foods, specifically related to mobility health, this study aimed to understand Chinese consumers' perceptions of the importance of these foods, trust, and willingness to purchase and pay a premium for such foods. A mixed-methodological approach using both focus groups and a survey was used to collect data from Chinese living in New Zealand. Findings show Chinese consumers place a high level of importance on their mobility health. Level of importance increased when asked about the believed importance of this area later in life. Key factors influencing Chinese consumers' willingness to purchase functional foods were also identified: the carrier/nutrient combination; trust in the product's country of origin and in the various institutions that may be involved in the production of functional food products; trust in both the product brand and how it is advertised; health motivation; and price. The study offers the food industry insights into the development and marketing of mobility-related functional foods targeted to this market.

## KEYWORDS

Consumers; functional foods; mobility health; willingness to purchase and pay; young Chinese

## Introduction

The market for functional food products has grown in recent years due to increased promotion and consumer awareness of healthy lifestyles and eating (Day, Seymour, Pitts, Konczak, & Lundin, 2009). The desire to enhance diet and health has become a driver for the development of functional food products. Functional foods are those that provide health benefits beyond basic nutrition and include whole, fortified, enriched, and enhanced foods, and have a potentially beneficial effect on health (Hasler, 2000). There are many different factors that influence consumers' perceptions, trust, and willingness to purchase and pay a premium for functional foods. It is

important to understand these factors in order to develop and market these products successfully.

China offers tremendous export potential for the development of new products. China has a population of approximately 1.35 billion, and has the largest growing economy in the world (Yu, Stith, Liu, & Chen, 2012). These factors combined create a strong environment for exported goods. In 2011, the Chinese government released a “Healthy China 2020” program. This project was designed to promote healthy eating and active lifestyles to reduce the prevalence of chronic illness within the Chinese population (Hu, Liu, & Willett, 2011). There are many different risk factors that have led to the dramatic increase in chronic illness in China such as obesity, lack of physical activity, and poor nutrition (Yang, 2008). Chronic illnesses not only have a large effect on an individual’s health and quality of life but can also have large social and economic consequences (Yang, 2008). The increase in chronic illness and the “Healthy China 2020” program indicate a market opportunity for new functional food products that are designed to improve the health of the Chinese population.

Currently there is little literature on Chinese consumers and functional foods. The one exception is Siegrist, Shi, Giusto, and Hartmann’s (2015) study, which investigated consumer acceptance of functional foods in China. The study found that the majority (up to 65%) of consumers showed higher willingness to purchase functional food products over those with no additional benefits (e.g. conventional food products). This result indicates that Chinese consumers are interested in food products that provide specific beneficial health effects. Health motivation was found to be a significant predictor within the Chinese population studied. Consumers who considered health to be an important aspect in food choice had higher willingness to purchase functional foods. This specific study suggests that there is potential that functional food products will appeal to mass markets in China.

The category “functional foods” is broad and as such the importance of factors (e.g. perceptions, trust, and willingness to purchase and pay) is likely to differ in accordance with the desired health benefits. Therefore, there is merit in understanding the perceptions of foods targeted toward particular health domains. One category of functional food products of high international interest yet to be explored is foods developed to improve mobility health. Mobility-related chronic illnesses are currently increasing, in particular obesity and osteoporosis (Vincent, Vincent, & Lamb, 2010). One of the explanations for this is the aging population, who experience a decline in muscle strength and increased weakness of bones associated with old age. The prevalence of these illnesses is increasing dramatically throughout the world, including within the Chinese population (Wu, 2006). Forhan and Gill (2013) defined functional mobility as the manner in which people are able to move around in the environment in order to participate in activities of daily

living and move from place to place. Functional mobility provides opportunities for a person to engage in physical activities at home, school, and in the community, thereby contributing to health-related quality of life. Mobility includes the health of bones, joints, and muscles and their ability to function. To date, despite a widely recognized need to improve mobility health and tremendous opportunities for the food industry to develop and export such products, there is surprisingly no research that explores links between important concepts like “perceptions”, “trust”, “willingness to purchase and pay a premium” in relation to mobility health-related functional food products, and Chinese consumers. Although mobility-related diseases primarily affect an elderly population, it was deemed useful to investigate how young people perceive these health issues and the role of functional foods in helping prevent and combat these. Notably, the young Chinese consumers are important to understand given that this segment is thought to be more health conscious (Zhang, Lusk, Mirosa, & Oey, 2016) and believed to become much wealthier than their older counterparts (Attané & Gu, 2015).

Thus, the objective of this exploratory study is to identify young Chinese consumers’ perceptions of importance and trust toward functional foods. In addition, the study aims to further understand how these foods will likely be accepted in the Chinese marketplace by identifying factors that influence Chinese consumers’ willingness to purchase and pay a premium for foods in this area. To do this, a two-staged mixed-methodological approach that combined both qualitative (exploratory focus groups) and quantitative (survey) techniques was used to explore the factors “perceptions of importance”, “trust”, “willingness to purchase and pay” in relation to functional foods related to mobility health among Chinese consumers living in New Zealand who were aged between 18 and 30 years. The research question necessitated this mixed-methods approach; given the current dearth of relevant literature in this topic area, it was important to explore the meanings that these young Chinese ascribe to health, mobility, foods, and functional foods before trying to quantifiably measure these meanings across a larger sample population. Qualitative and quantitative combinations are now common in consumer and marketing research as they are widely acknowledged as being capable of discovering new perspectives and providing confirmation of results (Bryman, 2008). Before providing further details on materials and methods employed in the study, further contextual information is provided about Western consumers and functional foods as well as a synopsis summarizing the influence of Chinese cultural beliefs on food choice.

### ***Western consumers and functional foods***

There are many studies looking at links between consumer-related concepts (e.g. knowledge and acceptance) and functional food products across various countries. For example, Frewer, Scholderer, and Lambert (2003)

looked at consumer acceptance of functional foods and issues for the future. In the past it was believed that consumers would accept a functional food product if it had a concrete and tangible benefit to the consumer. However, this particular study found that functional foods will not automatically be successful and there are many more influencing factors, such as understanding consumers' risk perceptions and concerns surrounding new processing technologies, emerging scientific innovations, and the individual's health status. The knowledge that functional foods can provide population-wide benefits is not generally accepted (Frewer et al., 2003). Grunert (2010) found that the carrier/nutrient combination influences consumer perceptions of functional foods. The carriers, which seemed healthier and more natural, were generally more accepted by consumers. Health claims, taste, and price were also found to be extremely important factors when purchasing a functional food (Siegrist et al., 2015). Consumers are willing to pay more for foods with proven benefits; however, this premium may not be as high as what the industry expects (Bower, Saadat, & Whitten, 2003). Trust in the food industry, as well as product confidence, has an impact on functional food acceptance. Increased trust in the industry and confidence in the product is correlated with a stronger belief that the product will have a beneficial effect (Urala, Arvola, & Lähteenmäki, 2003).

### ***The influence of Chinese cultural beliefs on food choice***

There are clear differences in the behaviors and attitudes toward food choice between Western and Chinese society. This creates many challenges with regard to producing and developing products for the Chinese market. China has a strong history of traditional Chinese medicine and the use of food as a way to cure illness and disease. This medicine has been practiced within China for thousands of years. One of the key components of Chinese traditional medicine is that food and medicine originate from the same source (Chau & Wu, 2006). This concept is strongly related to functional foods, the use of food as a way to combat chronic illness. While consumers are known for being relatively price sensitive, there is an emerging market of consumers willing to pay a higher price for more nutritious, higher-quality, and safer products within China (Wang, Mao, & Gale, 2008). In recent years, food safety has had a large impact on Chinese food purchasing and trust in products. Over the years, there have been many crises in China that have affected consumer confidence (Jiang & Zhu, 2013). There appears to be a huge potential for foreign food companies to export to the Chinese market given the strong level of confidence associated with foreign products (Knight, Gao, Garrett, & Deans, 2008).

## **Materials and methods**

### ***Research location and participant selection***

The research was conducted in New Zealand. To participate in the study, individuals had to be of Chinese ethnicity from Mainland China and have lived in New Zealand for less than 5 years. This criterion was set to reduce the likelihood that participants had been substantially influenced by New Zealand culture. All of the participants were between the ages of 18 and 30 years and all were able to communicate in verbal and written English. Given that the focus for the research was to understand young Chinese consumers' perceptions, it was deemed important to include regular young Chinese consumers who would most likely typify perceptions about concepts of health and functional foods and to not focus recruitment on attracting health-conscious consumers or those that are knowledgeable about functional foods. The fairly homogenous demographics of the participant group (i.e. young Chinese ethnicity from Mainland China and lived in New Zealand for less than 5 years) brought the required focus to the sample (Patton, 2005). Ethical approval was granted by the institution's Human Ethics Committee (Reference numbers: 15/01B and 15/02B).

### ***Study 1: Focus group data collection and analysis***

Three focus groups were conducted with Chinese consumers ( $n = 21$ , seven individuals per focus group). Focus groups offer rich details regarding many complex experiences and the reasoning behind the individual's beliefs and behaviors that may not be feasible using methods such as one-on-one interviews or questionnaires. Focus groups allow interviewers to gain a large amount of information in a limited period of time and have been used successfully in the past to gather information on Chinese consumers' perceptions and purchase intentions for healthy food and beverage products (Lee, Lusk, Mirosa, & Oey, 2015). The use of exploratory focus groups both enabled an in-depth exploration of the relevant concepts (perceptions of importance, trust, and willingness to purchase and willingness to pay) and served to provide guidance in the development of the subsequent survey. The focus groups were conducted at a New Zealand University in a neutral location with each lasting approximately 1 hour. The discussions were conducted in English with a native Mandarin-speaking assistant present in case of potential problems arising due to language. The focus groups were semi-structured and consisted of 10 main open-ended questions related to functional foods and health. A trained moderator, following a moderator's guide (see Figure 1), led the discussions. The focus groups were recorded and transcribed verbatim. Participants involved in the focus groups were given a ten-dollar grocery voucher as compensation.

**Introduction:** Hello. Firstly I would like to thank you all for coming to this group discussion. It shouldn't take any longer than 90 minutes and at the end you will receive a \$10 supermarket voucher. Throughout the discussion I will be asking a few questions and I would like you to just discuss the questions amongst yourselves. I would like to remind you that this discussion is confidential and nothing that you say during the course of the session will be repeated to any person outside of the group. Are there any questions before we begin?

**Ice Breaker:** Please we go around the table and say your name tell the rest of the group your favourite food and why.

**Focus Group Questions:**

1. What comes to mind when I mention the words 'functional food'?  
*After initial discussion, the Moderator then provides a definition.*
2. Do you currently purchase any foods of this classification? If so, what?
3. Do you think that you might be willing to purchase functional foods later in life? Why?
4. Do you believe there is a link between what you eat and having good health? Why? → Do you purchase any specific food products as a way to improve your health?
5. If there were products on the market with a specific health benefits would you purchase?
  - a. Would you be willing to pay a premium for products with these health benefits? Why?
6. Has your culture influenced your food purchasing and perceptions of health and wellness? How?
7. What does the term 'functional mobility' mean to you?  
*Moderator to provide a definition following discussion.*
8. Do you have any knowledge of chronic illnesses that can occur in the bones and muscles?
  - a. Do you know of any foods that can help with these problems or with prevention of these problems?
9. If there were products on the market said to improve the health of your bones and muscles and/or help with the prevention of such illnesses in the future would you trust these product claims? (Are there products from particular countries whose claims that would trust more/less? Why?)
10. Would you be willing to purchase these products? Why? (If so, at what price – would you be willing to pay a premium for the specified functional health benefit? How much?)

**Wrapping up:** We only have a few minutes left now, is there anything else people would like to say?

**Conclusion (~ 2–3 minutes):**  
Thanks everyone for participating in this group discussion today. If you do have anything else you wish to discuss here is the email address to contact us on if anything else comes up that you would like to share.  
(Hand out vouchers.)

**Figure 1.** Moderator's semi structured focus group guide.

The themes identified through the focus group were used in conjunction with the literature to develop the survey in study 2. The thematic analysis framework outlined in Braun and Clarke (2006) was used to analyze the focus groups. The development of themes and analysis of qualitative data were carried out using qualitative data analysis software NVivo (QRS international Pty Ltd, NVivo, version 10).

## **Study 2: Survey data collection and analysis**

A survey was used to further explore themes identified in the focus group with a larger sample size. The survey was designed on a web-based platform, Qualtrics international (Qualtrics, Ohio), and consisted of eight different sections: awareness of functional foods; mobility health; metabolic health; infant and maternal health; health motivation; trust in various countries and industries, willingness to purchase functional foods; and participants demographics. The survey consisted of 60 questions and took approximately 10–15 minutes to complete. Note that while the survey addressed three different health domains, only the mobility section is reported on in this paper. [Figure 2](#) shows how each of the specific constructs of interest was measured.

The survey link was given to participants through both email and intercepting young Chinese individuals at various universities throughout New Zealand and providing them with an Ipad to fill out the survey. Full surveys were completed by 193 participants. Basic descriptive analysis methods were used to analyze the results. This included running an analysis of variance (ANOVA) on the survey data using SPSS Predictive Analysis Software (IMB SPSS Software, Chicago). ANOVA and Tukey's post hoc, at the  $p < 0.01$  level of significance, were used for comparing means to find out the level of trust associated with various countries, continents, and institutions. Spearman's correlation coefficients were also conducted to test the relationship between variables.

## **Results**

### **Study 1: Focus groups**

The three key thematic groups were “mobility health”, “Chinese culture and values”, and “other factors influencing willingness to purchase functional foods”. Each of these groupings of themes consisted of various subthemes as is detailed in [Table 1](#). [Table 1](#) also provides illustrative quotes to exemplify the discussions had around each theme.

### **Focus group themes**

Participants in the groups had differing perceptions in relation to the importance of, or concern placed on, their mobility health. Approximately one-third of the participants stated that they were concerned about their mobility health and that this is an area of health they think about. The other two-thirds of this group agreed that at this stage their mobility health is not an area of concern but it might become so later in life. The main foods/nutrients participants associated with this area were red meat, milk, calcium, fish oil, and protein. In Chinese culture, there is also a strong belief that food is used



**Perceptions of importance**

Question: How much do you agree with this statement? I currently see the health of my bones, joints and muscles as [Extremely Unimportant (1) - Extremely Important' (7)]

Question: How much do you agree with this statement? Later in life, I will see the health of my bones, joints and muscles as [Extremely Unimportant (1) - Extremely Important' (7)]

Question: How much do you agree with this statement? I am concerned about the development of diseases and illnesses associated with bones and muscles [Do not Agree at all (1) - Strongly Agree (7)]

**Trust**

*A scale was adapted from Siegrist's (2000) to fit the current context of the study.*

Question: How much trust do you have in the following? the food industry within China, food products imported to China, pharmaceutical industry, Chinese government agencies e.g. CDFA, MOA, AQSIQ, overseas government agencies e.g. WHO, UN, AFO? [No trust at all (1) - Very high trust (7)]

Question: How much trust do you have in food products from the following regions? China, Asia, New Zealand, Australia, Europe, North America? [No trust at all (1) - Very high trust (7)]

**Willingness to purchase**

Question: If there were functional food products on the market which allowed you to improve the health of your bones, joints and muscles, how likely would you be to purchase these? [Very Unlikely (1) - Very Likely (7)]

Question: If there were functional foods on the market that could help to prevent bone, joint and muscle related diseases and illnesses developing, how willing would you be to purchase these? [Very Unlikely (1) - Very Likely (7)]

**Carrier/nutrient combination**

Question: How likely would you be to purchase these functional food products if they could help with the health of your bones, joints and muscles? (Juice with added calcium, Milk with added calcium, Muesli bar with added protein, Muesli bar with vitamin D) [Very Unlikely (1) - Very Likely (7)]

**Willingness to pay a premium**

Question: If there were functional food products on the market that could help improve the health of your bones, joints and muscles, how much of a premium would you be willing to pay for these? [‘No premium, 20% extra, 40% extra, 60% extra, 80% extra, 100% extra, Beyond 100% extra]

**Health motivation**

*An adapted version of the health motivation subscale by Renner, Sproesser, Strohbach, & Schupp (2012) was used.*

Question: How much do you agree with these statements? I choose certain foods to have a balanced diet; I choose to eat certain foods to stay healthy, ‘I choose to eat certain foods to stay in shape [Strongly Disagree - Strongly Agree (7)]

**Figure 2.** Questions and scales that were used to measure each of the constructs.

as medicine. Food is directly related to health and well-being. Chinese participants in the focus group had a strong preference for foods that were both fresher and more natural. There are many different factors that were found to influence Chinese consumers' willingness to purchase functional foods. These included price, the carrier/nutrient combination of the functional food, health motivation, trust, safety of the product, brand, and advertising. All of these factors had an influence on consumers' willingness to purchase functional food products and, as such, related constructs were included into the subsequent survey.

**Table 1.** Key themes associated with Chinese consumers' perceptions of functional foods and mobility health.

Functional food themes	Subtheme	Illustrative quotes
<b>Mobility health</b>	Concern	<i>"I don't pay too much attention to that" "I am concerned about it because I go to the gym and do weights. I am concerned I am going to do something harmful to my spine when I am older, so need to be careful now"</i>
	Knowledge of foods/nutrients associated with this health domain	<i>"I think older people in China try to eat like fish oil to help with health of heart and joints"</i>
	Health need	<i>"In China we don't normally buy food products to stay healthy. We only buy things when we are sick"</i>
<b>Chinese culture and values</b>	Traditional Chinese medicine	<i>"We try to choose Chinese medicine because it has lower side effect instead of pure chemical. So kind of like Chinese medicine will help your body to maintain balance, rather than using pure drug to maintain it"</i>
<b>Factors influencing willingness to purchase functional foods</b>	Price	<i>"I consider the price and nutrition"</i>
	Carrier/nutrient combination	<i>"Some of the food has not really good stuff and some are natural, so I'd choose natural"</i>
	Health motivation	<i>"It all depends, I want to get stronger and healthier, so I will buy functional food like protein shake to make me stronger"</i>
	Trust	<i>"There is concern with the safety of the packaged food in China, some manufacturers that produce the milk add some chemicals in the milk to make it seem healthier but it is harmful"</i>
	Brand	<i>"I would choose the foreign brand, then the famous local brand, then the brand I have never heard of before"</i>
	Advertising	<i>"Sometimes a journalist or newspaper will copy a research article saying that an element or compound is good for health. Later a manufacturer will find this article and will then address the compound in their food products, so that people will come to buy the product"</i>

## Study 2: Surveys

### Respondent demographics

The respondent's demographics are displayed in Table 2. The survey consisted of 127 females and 62 males, with four respondents preferring not to answer. The majority of respondents were from North (31.6%) and South China (39.4%). The mean age of survey respondents was 24, with all 193 of the respondents between the ages of 18 and 30 years.

### Perceptions of importance of bones, joints, and muscles now versus later in life

A paired *t*-test was used to analyze the perceptions of importance of bones, joints, and muscles now and later in life. This was to test whether the perceptions of importance placed on this area of health increased with age. There was found to be a significant difference ( $p < 0.01$ ) in means between the two variables. Perceptions of current importance of bones, joints, and muscles had a mean of 5.74, increasing to 6.05 later in life, moving from the somewhat important category to important. This indicates that these young

**Table 2.** Respondent demographics.

	Frequency	Sample (%)
<b>Sample size</b>	193	100
<b>Gender</b>		
Male	62	32.1
Female	127	65.8
Prefer not to answer	4	2.1
<b>Location in China where respondent originated</b>		
North China	61	31.6
East China	27	14
South China	76	39.4
West China	6	3.1
Central China	19	10
Prefer not to answer	4	2.1
<b>Highest level of education</b>		
No schooling completed	0	0
High school	4	21.2
Bachelor degree	114	59.1
Masters degree	32	16.6
PhD	6	3.1
Prefer not to answer	0	0
<b>Employment status</b>		
Student	129	66.8
Full-time employed	34	17.6
Part-time employed	16	8.3
Self employed	7	3.6
Out of work	6	3.1
Other	1	1
Prefer not to say	0	0

Chinese consumers believe they will place a higher importance on the health of their bones, joints, and muscles later in life.

**Carrier/nutrient combination**

An ANOVA was conducted in different carrier combinations to determine whether there were significant differences ( $p < 0.01$ ) between mean willingness to purchase for the different carrier combinations. Table 3 shows the ANOVA and Tukey’s post hoc results for willingness to purchase the different carrier/nutrient combinations. Consumers were significantly more likely to purchase the milk with added calcium over any of the other combinations, with a mean willingness of 5.61.

**Table 3.** Mean likeliness to purchase rating for different functional food carrier/nutrient combinations (7-point likert scale where 1= Very unlikely, 7= very likely). Different alphabetic letters represent significantly different samples ( $p < 0.05$ ).

Carrier/nutrient combination	
Juice with added calcium	4.65b
Milk with added calcium	5.61a
Muesli bar with added protein	4.65b
Muesli bar with added vitamin D	4.68b

**Table 4.** Mean trust rating associated with various institutions (7-point likert scale, where 1= not trust at all, 7=very high level of trust). Different alphabetic letters represent significantly different samples ( $p<0.05$ ).

Trust associated with various institutions	
Food industries overall	4.17c
Food industry within China	2.67d
Food products imported to China	4.55bc
Pharmaceutical industry	4.62b
Chinese government agencies	4.30bc
Overseas government agencies	5.18a

**Table 5.** Mean trust rating associated with various countries/continents (7-point likert scale, where 1= no trust at all, 7= very high level of trust). Different alphabetic letters represent significantly different samples ( $p<0.05$ ).

Trust associated with various countries	
China	2.75e
Asia	3.27d
Australia	5.36b
New Zealand	5.80a
Europe	5.35b
North America	4.98c

### *Trust associated with various institutions and countries*

ANOVA was also carried out on trust between various institutions and countries/continents to see if there were significant differences in trust between the different areas or industries involved in the production of functional food products. Table 4 shows the ANOVA and Tukey's post hoc results for trust associated with various institutions. Overseas government agencies had a significantly higher level of trust associated than any of the other institutions, with a mean of 5.18. The food industry within China had a significantly lower level of trust associated with it with a mean of 2.67.

Table 5 shows the ANOVA and Tukey's post hoc results for trust associated with various countries and continents. New Zealand had the highest level of trust associated with it, with a mean rating of 5.80. China had a significantly lower level

**Table 6.** Spearman's correlation coefficient( $r$ ) on mobility and willingness to purchase functional foods ( $n=193$ ).

	Spearman's	
	$r$	$p$
Concern for development of illness related to mobility health versus Willingness to purchase functional foods to prevent these illnesses occurring	0.654**	0.01
Importance of bones, joints, and muscles versus Willingness to purchase functional foods to improve mobility health	0.444**	0.01

\*\* Indicates correlation is very significant

of trust than the other countries/continents in question, with a mean trust rating of 2.75.

### ***Mobility and willingness to purchase functional foods***

Spearman's correlation coefficient was used to test the relationship between different variables. The result from Spearman's correlation coefficient shown in Table 6 below indicated that there was a significant relationship ( $p < 0.01$ ) between concern for developing an illness or disease in the bones, joint, and muscles and willingness to purchase functional foods to prevent these problems from occurring. As concern increased, so did the willingness to purchase preventative functional foods. It is clear there is a relationship as the correlation coefficient is above zero. The result was similar for importance of the bones, joints, and muscles versus willingness to purchase functional foods to improve the health in this area. As importance increased, so did the willingness to purchase functional foods to improve health of bones, joints, and muscles. The relationship between these two variables had a correlation coefficient of 0.444 and was significant as  $p < 0.01$ .

### ***Health motivation and willingness to purchase functional foods***

The result from Spearman's correlation coefficient shown in Table 7 below indicated that there was a significant relationship ( $p < 0.01$ ) between health motivation and willingness to purchase functional foods for oneself, and a significant relationship between health motivation and purchasing functional foods to improve health of bones, joints, and muscles. This means as concern increased, so does the willingness to purchase preventative functional foods. Again a relationship was evident as the correlation coefficients were above zero at 0.593 and 0.592.

### ***Premium willing to be paid for mobility-related functional foods***

The majority of consumers (74%) were only willing to pay 40% extra or less for functional food products in this area, with the largest proportion of consumers (31%) only willing to pay 20% extra. A group of approximately 14% of respondents said they would not pay any premium on functional food products.

In summary, the stage one qualitative analysis identified key factors influencing young Chinese consumers' general perceptions of mobility health-related

**Table 7.** Spearman's correlation coefficient( $r$ ) and health motivation influence on willingness to purchase functional foods ( $n=193$ ).

	Spearman's	
	$r$	$p$
Health motivation versus willingness to purchase functional foods for oneself	0.593**	0.01
Health motivation versus willingness to purchase functional foods to improve mobility health	0.529**	0.01

\*\* Indicates correlation is very significant

functional foods while the quantitative analysis in stage two identified factors that influence Chinese consumers' purchase decisions in this area.

## Discussion

The present study investigated Chinese consumers' perceptions of importance, trust, willingness to purchase, and pay a premium for functional foods targeting mobility. The results showed that Chinese consumers place a high level of importance on their bones, joints, and muscles. This importance increased when asked about the believed importance of this area later in life. This indicates that consumers are aware that the majority of mobility-related illnesses such as osteoporosis, mobility disabilities, and arthritis occur later in life. This finding was reinforced throughout the focus group, as many of the participants acknowledged that while it is not a current concern as nothing is wrong, they expect that as they age and problems begin, this importance will increase. A correlation was found between placing a higher level of importance of bones, joints, and muscles and being more willing to purchase functional foods to improve this health area.

It was found that as concern regarding the development of mobility-related illnesses increased, so did Chinese consumers' willingness to purchase functional foods to prevent these illnesses from occurring. This result suggests that as the prevalence of these illnesses continues to increase, more consumers will become more concerned about the development of these issues, and therefore more willing to purchase functional foods to prevent these illnesses from occurring. This highlights the potential for mobility-related functional food products in the Chinese market as the prevalence of these diet-related illnesses continues to increase. Young Chinese consumers may not be aware of the extent of these issues and increasing prevalence within the population. Educating the younger Chinese population about the mobility-related problems that could occur in the future might increase the likelihood of activities, or actions being taken, such as purchasing functional foods, in order to protect the health of bones, joints, and muscles. Frewer et al. (2003) also found that the individual's health status had an impact on willingness to purchase functional foods. This suggests that as prevalence of these mobility-related illnesses continues to grow, more consumers may purchase functional food products.

The research resulted in the identification of other key factors that influenced Chinese consumers' willingness to purchase functional food products. The first of factors was the carrier/nutrient combination. In the survey, participants were asked how willing they would be to purchase various functional food nutrient/carrier combinations. The mean rating for willingness to purchase milk with added calcium (Table 3) was significantly higher than any of the other carrier/nutrient combinations. One of the likely explanations for this finding is that the milk and calcium combination was the only one of the carrier/nutrient combinations that occurs naturally. Grunert (2010) found that European consumers

preferred carriers, which were perceived as being both natural and healthy. This belief is thought to be due to the idea that fortification of a product where there is no link between the carrier/nutrient combinations could cause undesirable off-flavors in that food product. In the development of functional food products for the Chinese market, the carrier and nutrient combination needs to be as natural as possible in order to maximize consumers' willingness to purchase the product.

The focus groups and survey revealed a second factor that influenced Chinese consumers' willingness to purchase functional foods: trust. Food being safe was found to be a major concern within the Chinese population studied. Social trust was one of the important factors to emerge from the project. This is due to the many food scandals that have occurred in China over the past two decades, which has influenced consumer confidence and trust with the Chinese food industry (Knight et al., 2008). Table 5 shows the trust Chinese consumers associate with various countries. The result showed that Chinese consumers associated the highest level of trust with New Zealand. This is a promising result for export products coming from New Zealand. Urala et al. (2003) found that consumers associate product confidence and having trust in the industry producing a food product increases the belief that the functional food is going to have a beneficial effect on health. Table 4 shows the trust Chinese consumers' associate with various institutions that may be involved in the production of functional food products. It was found that consumers had the least amount of trust in the Chinese food industry. This highlights the demand for foreign goods within China, as there is a lack of trust in their own industry. It suggests that foreign functional foods may be more successful in the marketplace than those produced by the Chinese food industry. Product confidence has a positive influence on willingness to purchase functional foods, so the trust associated with the industry producing the product is extremely important.

On a related note, the importance of trust in both the product brand and how it is advertised was also important. Chinese consumers want to have trust and faith in the product they are purchasing. In the focus groups it was stated that the factory where the food was produced and the manufacturer strongly impacted their willingness to purchase food products. Participants' preferences when purchasing food products were firstly for the foreign brand, then the well-known brand, and finally the brand they had not heard of. Advertising was found to be a factor that contributed to Chinese consumer willingness to purchase functional foods. During the focus group one respondent discussed the importance of information being advertised or publicized through an influential person such as a scientist, political leader, through a research article, or even through a famous daughter or son. This is likely related to the common Chinese value of conformity and having respect for authoritative figures (Lee, Lusk, Miroso, & Oey, 2014). This offers ideas to food marketers on the best techniques to advertise and promote products within the Chinese market.

**Table 8.** Premium willing to be paid for functional foods, which can help with health of bones, joints and muscles.

Premium willing to be paid for foods which can help to improve mobility health	Percentage of total respondents (n = 193)
0%	14%
20% extra	31%
40% extra	29%
60% extra	12%
80% extra	7%
100% extra	4%
More than 100%	3%

A third factor was the relationship found between health motivation and willingness to purchase functional foods. As the Chinese consumers' level of health motivation increased, so did the willingness to purchase functional food products. This indicates that individuals who are more motivated to lead a healthy lifestyle and make healthy choices are more inclined to purchase functional food products. This result was found both for foods that can improve mobility and for the purchase of functional foods for oneself more generally. This result implies that if there was more education on healthy lifestyles, more people may become more health motivated and therefore become more willing to purchase functional food products.

A fourth and final key influencing factor was the price of the product. [Table 8](#) shows the premium Chinese consumers are willing to pay for functional foods produced to help with mobility. The majority of participants indicated they would not pay more than 40% extra for these foods with added benefits. This is similar to the finding by [Menrad \(2003\)](#), where it was found that the majority of consumers are willing to pay 30–50% extra for functional food products. Chinese consumers are known for being very price sensitive, which could be a reason for why the premium they are willing to pay for functional foods is not higher. Throughout the focus group it became clear that price was one of the first things considered when purchasing food products, seven out of the 21 participants said they would not pay extra for functional food products unless it was a necessity.

## Conclusions

By exploring young Chinese consumers in relation to functional foods related to mobility health, this study adds to a limited field of Chinese consumer food-related literature available in the English language. The major contribution of this study is that it is the first study to have specifically explored Chinese consumers' perceptions, trust, and willingness to purchase and pay a premium for functional foods related to mobility. It was found that key factors influencing Chinese consumers' willingness to purchase



functional foods were: the carrier/nutrient combination; trust in the product's country of origin and in the various institutions that may be involved in the production of functional food products; trust in both the product brand and how it is advertised; health motivation; and price. In terms of mobility health as a specific health domain, results indicated that Chinese consumers place a high level of importance on the health of their bones, joints, and muscles. It was also found that Chinese consumers believe this importance is going to increase later in life. There was also found to be a link between having a higher level of concern for mobility-related illnesses and having a higher willingness to purchase functional foods that can prevent these illnesses from occurring.

One limitation of this survey was the fact that the sample was taken from young Chinese consumers living in New Zealand (18–30 years). The Western influence within New Zealand may have had an impact on some of the respondent's perceptions. However, the criterion was set that all respondents had to have immigrated to New Zealand within a 5-year period. This was to minimize bias and hopefully ensure the survey participants still had strong connections to China. It is important to view the survey results in the context of the study as opposed to a true representation of the Chinese population. Successful studies have been carried out in the past in which young Chinese immigrants have been used as a sample for investigations into Chinese perceptions or beliefs, such as by Zhang et al. (2016) and Lee, Lusk, Miroso, and Oey (2016). Further exploration of the validity of these findings with a wider, more representative, study in Mainland China is warranted.

An advantage, but also a limitation, of this study is its exploratory nature. While it provides a good overview insight into a number of important constructs (perceptions of importance now and later in life, trust, willingness to purchase, and pay a premium for functional foods), this breadth has come at the expense of a more detailed analysis of each construct. Future research is now required to expand on this exploratory work, applying more detailed analysis of each area of interest. For example, the results for willingness to pay a premium for functional foods were an interesting finding and are worthy of further investigation. One option would be to consider how willingness to pay varies for different types of product offerings (based on nutrient carrier combination, country of origin, labeling information, etc.) and also varies between different consumer segments. The study of Wu, Wang, Zhu, Hu, and Wang (2015), which used mixed logit and latent class models to measure preferences and willingness to pay for pork (based on traceability information, quality certification, appearance attributes, and other influencing factors), provides a good example of how such a future study could be conducted. Interestingly, these authors obtained the price points for each level of attribute inputted into the conjoint analysis by running an experimental auction, which too would be an interesting next

step for explorations on Chinese consumers' willingness to pay for functional foods. Another way in which future research could enhance the depth of our initial exploratory findings is comparing results across different groups of consumers based on varying socio-demographic and lifestyle factors. For example, just as van der Zanden, van Kleef, de Wijk, and van Trijp (2014) compared knowledge, perceptions, and preferences of the elderly (both independently living and living in a residential home) regarding protein-enriched functional food, an explicit comparison of segments of young Chinese consumers based on their living arrangement or alternatively on their mobility health status could yield interesting and useful results.

The constructs explored in this study were those deemed by the participants in the first-stage qualitative focus group discussions to be the most related to the subject of investigation. However, future research into Chinese perceptions of functional food need not of course be limited to just these. Literature on the determinants of intention to purchase synthetic functional foods (Rezai, Kit Teng, Mohamed, & Shamsudin, 2014) has investigated constructs such as perceived susceptibility, perceived severity, perceived benefits, perceived barriers, attitude, cue to action or subjective norms, self-efficacy, and perceived behavioral control, all of which are worth further investigation in relation to Chinese consumers and functional foods.

The areas of research outlined above offer many opportunities for future research. China offers a tremendous opportunity for exporting foods and beverages. Understanding consumers' perceptions of new and emerging foods is essential for the successful design and marketing of these products, which may contribute to help combat the current epidemic of diet-related diseases. Undoubtedly, this research area will continue to grow and expand over the coming years as interest in functional food products increases in China.

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