Women, Men and Certified Food: Opting Out of the Conventional Chinese Food Market

Dr Breda McCarthy*, James Cook University, breda.mccarthy@jcu.edu.au
Dr Hong-Bo Liu, James Cook University, hongbo.liu@jcu.edu.au
Dr Tingzhen Chen, James Cook University, tingzhen.chen@jcu.edu.au

Abstract

Understanding the purchase motivations and demographics of Chinese consumers is important for countries like Australia that depend heavily on food exports. This study suggests that affluent, middle class Chinese citizens are opting out of the conventional food market, with men showing a preference for green food and females showing a preference for certified organic food, along with a desire to avoid genetically modified (GM) food ingredients. Certified food purchase is associated with demographic variables, such as income, education, age, gender, presence of young children, household size, living in developed cities and overseas experience. The study found that almost half of the sample is unaware that the concept of green food is different to that of organic food. The priority for the certified organic industry is to address this lack of knowledge and clearly explain what certified organic food is and how it differs from green food. Stressing its GM-free status is likely to enhance sales since there appears to be a segment of consumers that distrusts GM food.

Keywords: food safety, certified organic food, green food market, China, motivating factors, probit/logit model.

Track: Consumer Behaviour

1.0 Background and conceptual foundations

There has been acute public concern with food safety and urban, middle class consumers show a willingness to pay a premium for safe food or green food (Liu, Pieniak and Verbeke, 2013). Green food refers to the "controlled and limited use of synthesized fertiliser, pesticide, growth regulator, livestock and poultry feed additive and gene engineering technology" (Liu, Pieniak and Verbeke, 2013:94) From a marketing perspective, it is critical to understand how the Chinese certified food market is segmented. According to Kotler (1988), market segmentation is a three-step, sequential process, entailing market segmentation, market targeting and positioning. Although the number of studies conducted on Chinese consumers and organic food is growing (Roberts and Rundle-Thiele, 2007; Yin, Wu, Du & Chen, 2010; Sirieux et al., 2011; Bing et al., 2011; Lobo and Chen, 2012; Marchesini et al., 2012; Thøgersen and Zhou, 2012; Thøgersen et al., 2015), segmentation studies are sparse. Chinese studies show that gender, age, family size and average household income per year are the main socio-economic factors influencing willingness to pay for green food (Xia & Zeng, 2007; Xia & Zeng, 2008). Research on Western consumers indicates that organic food buyers exist across all demographic segments, with some small trends being evident. In particular, they may have higher levels of education, be more affluent, be women and have young children (Pearson et al., 2011). Demand for organic food is strongly linked

to beliefs about its healthiness, taste and environmental friendliness. Strong barriers to purchase exist, notably price and lack of convenient channels (Zhu, Li, Geng & Qi, 2013). With the increase in certified food labels in China, a better understanding of market segments is required.

2.0 Methodology

The purpose of this paper is to identify the determinants of green food and certified organic purchase and to explore purchase motivations. Based on the literature review, the following hypotheses have been advanced:

H1: Green and organic food consumption in China is influenced by demographic factors, notably gender, presence of children in the household, education and income.
H2: Chinese consumers are motivated to buy green and organic food for health and environmental reasons.

The population of interest was consumers of certified food in urban China. The survey instrument was originally developed in English and translated into Chinese. The survey contained a section on socio-demographic information and it covered purchase motivations, sources of information used in decision-making, outlets used to buy food, willingness to pay a premium for green food and consumer attitudes towards food safety. The survey was pilot tested on a convenience sample. Based on feedback from the participants, some questions were reworded to avoid ambiguity.

An online and paper-based survey was conducted in 2014. The internet was used to save time and money and access a large number of participants (Sue and Ritter, 2007) and it is a good way of recruiting the affluent segments of Chinese society (McKinsey, 2013). The survey was promoted by a major online wine merchant. A total of 402 consumers responded to the survey. The summary statistics of the sample are as follows: there was a female bias with 60% females and 40% males. Most respondents were young and 62% were aged 26-45 years. Household income was relatively high with 24% earning between $1,732 and $3,464 a month. The respondents were well educated with 42% having a degree.

A pilot study was used to probe some findings and the sample consisted of 80 respondents, who came from first tier, second tier and third tier cities. Most respondents were young, in the 35-44 age category, married and had children under the age of 12. Some respondents were University educated and most had a technical qualification or had attended Junior college. Many were earning between $1,045 and $2,090 a month. There were more females respondents than males.

3.1 The logit/probit model

Modelling is used to understand, explain, and predict the choices that are made. To do so, one can create an economic model of utility derived from the choice of each alternative. Generally, a single equation limited, dependent variable model such as the probit or Logit model may be summarised by the following equation. Utility is derived from the selection of an alternative j ($j = 1,0$) by the individual i ($i = 1,......t$) and that choice is a function of the attributes (e.g., price, quality) of that alternative to the individual, and the characteristics (e.g., income, educational attainment, presence of young children) of the individual. The binary probit/logit model is used for explaining a dichotomous, dependent variable. It has been widely used in diverse fields; originally in toxicology, and now it has gained popularity in econometric analyses (Maddala 1983; Ben-Akiva and Lerman, 1985). In this study, the dependent variable may take on only two values to indicate whether a consumer wants to buy organic/green food or not. Probit regression is an approach to handle categorical dependent variables, which is based on a rational choice perspective on behaviour (Green, 2002). It consists of observable independent variables and unknown parameters. Values of unknown parameters are estimated from a sample of observed choices made by decision makers when they are confronted with a choice situation.

4.0 Findings

The following section describes results from the probit/logit model and hence reports on the demographic factors driving green food and certified organic food. Table 1 shows the results of the binary probit model for green food purchase. Results show that demographic variables, notably, age, gender, presence of young children in the family, family size, education, income and overseas experience have an impact on green food purchase. Income, age, gender, presence of young kids (12 years old and under), family size are significant at the 5% level. Higher education and having overseas experience are significant at the 10% level. Age (older), gender, family size (larger), and education attainment below university are negatively related to green food purchase. Young, wealthy males, who have young children and who live in a small household are likely to be buyers of green food.

Table 1: Estimates of binary probit model for green food purchase

Variables	Coef.	Std. Err.	z	P>z
Age	-0.129818	0.0639425	-2.03	0.042**
Gender (Male:1; Female: 0)	-0.3155194	0.1370279	-2.3	0.021**
Presence of kids under 12 years old	0.2213435	0.090355	2.45	0.014**
Family size	-0.1522628	0.0663902	-2.29	0.022**
Education attainment below university	-0.2931753	0.1597256	-1.84	0.066*
Income	0.1142806	0.0535156	2.14	0.033**
Overseas	0.2334513	0.137162	1.7	0.089*
_cons ((Intercept/constant term)	0.1590166	0.4194188	0.38	0.705
LR chi2(8)	54.45			
Log likelihood	-248.5461			
Pseudo R2	0.0987			

Note: ** indicates 5% significance and * indicates 10% significance.

Table 2 (see below) shows the results of the binary probit model for organic food purchase. Income, age and gender, are significant at 5% level. Income, female, and living in tier 1 cities are positively related to certified organic food purchase. Older age, larger family size and lower levels of educational attainment are negatively related to certified organic food purchase. In the pilot study, most females (n= 10) agreed that their attitudes towards organic food were more positive than males.

Table 2: Estimates of binary probit model for organic food purchase

Variables	Coef.	Std. Err.	Z	P>z
Age	-0.1825845	0.0887858	-2.06	0.040**
Gender (Male:0; Female: 1)	0.3504368	0.1674492	2.09	0.036**
Family size	-0.1564761	0.0844896	-1.85	0.064*
Education attainment below university	-0.482365	0.2234442	-2.16	0.031**
Income	0.5647558	0.0705798	8	0.001**
Location (1st tier)	0.2185908	0.1136826	1.92	0.055*
_cons (Intercept/constant term)	-2.345338	0.5497214	-4.27	0.003**
LR chi2(8)		148.84		
Log likelihood		-164.36262		
Pseudo R2		0.3117		

Note: ** indicates 5% significance, and * indicates 10% significance.

4.1 Consumer motivations and benefits sought from certified food

All consumers scored medium to high on all items related to reasons to buy green food (M>3 on a 5-point Likert scale). While most of the motivating factors were considered important, the green food label, coming from humanely-treated stock; environmentally-friendly, absence of GM ingredients, health and safety, all received the highest scores. One-way Anova was performed and the certified organic food buyers rated the "does not contain genetically modified food ingredients" attribute and "improve the future health of my family" slightly higher in importance than the non-organic food buyers (see Table 3). It must be noted that 42% of the sample was unware that there was a difference between green food and certified organic food. This misapprehension on the part of the consumers may have positive or negative impacts on purchasing intentions and behaviour – but this was not tested in this survey.

The pilot study supported the findings, with respondents citing "quality assurance, safety, not harmful, health, no additives and nutrition" as they key reasons for buying green/organic food. Good health meant "not getting ill; no pollution; feeling energetic; body in good condition." Most of the respondents had heard of GMO with many stating that they did not want to buy genetically modified food and the reasons given were as follows: "US strategy; not safe; feedback of others; worry about the future; sceptical; unknown; uncertain; harmful for human body". Respondents believed that green/organic food was different from conventional food, and interestingly, respondents indicated that this belief was shaped by: "propaganda from government; word-of-mouth; internet; research; book; taste; safety; environmentally-friendly; belief; feeling and science". Females felt that they had a more positive attitude towards green/organic food than males. In order to cope with risk in the wake of food safety scandals, respondents were using a variety of strategies; comments were as follows: "cooking from home; buying certified food; buying direct from farmers; purchase overseas products; purchase from formal channels; purchase from big supermarket; watching

and analysing news reports; washing carefully; planting vegetables at home, listening to friends; doing research; purchasing popular products."

Table 3: Reasons for buying green food

Reasons	Overall Sample	Organic Food Buyers	Non-organic food buyers
The green food I buy is competitively priced.	3.71	3.74	3.70
The food I buy has the green label and is pesticide reduced.	4.00	4.08	3.97
The green food I buy helps support Chinese farmers.	3.77	3.84	3.74
The green food I buy has a well-known brand name or comes from a well-respected region.	3.32	3.25	3.35
Produce is fresh.	3.81	3.88	3.77
The green food I buy comes from a farmers market and there is a long-term, trusting relationship with grower.	3.48	3.43	3.50
Sourced within season.	3.73	3.62	3.77
Tastes good.	3.62	3.71	3.58
Comes from humanely treated livestock.	4.04	4.14	3.99
Environmentally-friendly in the way it is produced, packaged and transported.	4.12	4.24	4.07
Does not contain genetically modified ingredients.	4.11	4.27**	4.08
Green food will improve my future health.	4.18	4.27	4.15
Green food will improve the future health of my family.	4.23	4.37**	4.18
Green food is safe.	4.20	4.23	4.19
Green food is high quality and has high nutritional value.	4.05	4.16	4.01
Green food is easy to buy.	3.38	3.33	3.40
Green food is easy to prepare.	3.43	3.37	3.45

** sig. $p < 0.05$

Note: Purchase motivations were measured on a 5 point importance scale, where 1= not at all important and 5 = very important.

5.0 Discussion and contributions to the literature

Our study found that green food seems to be favoured by wealthy, educated Chinese males who have a young child. Apart from gender, these findings are in accordance with the literature. For instance, a study by Zhu et al., (2013) found that income and education influence green-food purchase intentions and behaviours. Chinese studies report that gender – being female - is an important demographic variable, along with income, education and family size, that influences willingness to pay for green food (Xia & Zeng, 2007; Xia & Zeng, 2008). Studies on Western consumers show that concern for young children is likely to increase organic food consumption (Kriwy & Mecking, 2012); the organic food buyer is likely to be female (Lockie *et al.,* 2004), female with children (Dettmann & Dimitri, 2009;

Van Doorn &Verhoef, 2011) and is likely to be highly educated (Govidnasamy & Italia, 1990; Kriwy & Mecking, 2012). This finding on gender is interesting. It may simply reflect barriers to certified organic food purchase faced by males, notably lack of familiarity with the label, doubt about certified traceable food and worries about excessively high prices (Wu, Xu and Gao, 2011; Liu et al., 2012). The problem of fraud, where companies falsely advertise pesticide-treated produce as organic, is an ever-present concern, leading to a large trust deficit (Marchesini et al., 2012; Li, Ge & Bai, 2013).

This research indicates that Chinese consumers who buy green food or certified organic food seek similar benefits. They are not that different from Western consumers who are motivated to buy organic food primarily out of health concerns, with product quality and concern about environmental degradation also acting as motivating factors (Pearson, 2002; Yiridoe et al., 2005; Pearson & Henryks, 2008). However the certified organic food buyers rated the "does not contain genetically modified food ingredients" attribute and "improve the future health of my family" slightly higher in importance than the non-organic food buyers. The importance given to "no GM ingredients" is somewhat surprising since half of the sample doesn't understand the difference between green food and certified organic food, GM food ingredients are not prohibited in green foods and several studies suggest that Chinese consumers accept GM foods (Huang et al., 2006; Zhang et al., 2010). China is the fourth largest producer of genetically modified crops in the world and continues to support biotechnology research in an effort to sustain food self-sufficiency policies (Curtis, McCluskey & Wahl, 2004). Given the supportive institutional framework, changing attitudes toward GM foods deserve scrutiny. The follow-up study suggests that Chinese consumers want to avoid genetically modified food ingredients. They appear to be opposed to it due to low institutional trust and personal health reasons, rather than ethical and environmental reasons. They are using a variety of strategies to cope with risk and have opted out of the conventional food channel.

The contribution of this paper includes identifying the determinants of green food and organic food purchase. This study had its limitations, such as the sample size given the population of China, reliance on self-reported data and potential that the survey method results in socially desirable responses.

References

Ben-Akiva, M., & Lerman, S., 1985. *Discrete Choice Analysis: Theory and Application to Travel Demand,* The MIT Press, Cambridge, MA.

Bing, Z., Chaipoopirutana, S., & Combs, H., 2011. Green product consumer behaviour in China. *American Journal of Business Research*, 4, (1), 55-71.

Curtis, K.R., McCluskey, J.J., & Wahl, T.I., 2004. Consumer acceptance of genetically modified food products in the developing world. *AgBioForum*, 7(1&2), 70-75.

Dettmann, R., & Dimitri, C., 2009. Who's buying organic vegetables? Demographic characteristics of US consumers. *Journal of Food Products Marketing*, 16, (1), 79-91.

Govidnasamy, R., & **Italia,** J., **1990.** Predicting willingness to pay for organically grown fresh produce. *Journal of Food Distribution Research*, 30 (2), 44-53

Green, W. (2002), *Econometric Analysis*, Prentice Hall, New Jersey.

Huang, J.K., Qiu, H.G., Bai, J.F., & Pray, C., 2006. Awareness, acceptance of, and willingness to buy, genetically modified foods in urban China, *Appetite*, 46, 144-151.

Kotler, P. 1988. *Marketing Management, Analysis, Planning, Implementation and Control*. Prentice Hall International, Englewood Cliffs, NJ.

Kriwy, P., & Mecking, R.A., 2012. Health and environmental consciousness, costs of behaviour and the purchase of organic food. *International Journal of Consumer Studies*, 36, 30–37.

Li, C., Ge, Y. & Bai, G., 2013. Issues concerning "greenification" of green food enterprises. *Asian Agricultural Research*, 5 (5), 3-8.

Liu, R., Pieniak, Z., & Verbeke, W., 2013. Consumers' attitudes and behaviour towards safe food in China: A Review. *Food Control*, 33, 93-104.'

Liu, X., Wang, C., Shishime, T., & Fujitsuka, T., 2012. Sustainable Consumption: Green Purchasing Behaviours of Urban Residents in China, *Sustainable Development*, 20, 292-308.

Lobo, A., & Chen, J., 2012. Marketing of organic food in urban China: Ana analysis of consumers' lifestyle segments. *Journal of International Marketing and Exporting*, 17 (1), 14-26.

Lockie, S., Lyons, K., Lawrence, G., & Grice, J., 2004. Choosing organics: a path analysis of factors underlying the selection of organic food among Australian consumers. *Appetite*, 43, 135–146.

Maddala, C., 1983. *Limited-dependent and qualitative variables in econometrics*, Cambridge University Press, Cambridge.

Marchesini, S., Hasimu, H., & Spadoni. R., 2010. An overview of the organic and green food market in China in Hass, Rainer Canavari, Maurizio, Slee, Bill (Eds.). *Looking East Looking West: Organic and Quality Food Marketing in Asia and Europe* (pp. 155-172). Wageningen, NLD: Wageningen Academic Publishers.

McKinsey 2013. China's e-tail revolution: online shopping as a catalyst for growth, McKinsey Global Institute, Seoul and San Fransciso, available at: http://www.mckinsey.com/insights/asia-pacific/china_e-tailing (accessed 15 October 2014).

Pearson, D., 2002. Marketing organic food: Who buys it and what do they purchase?, *Food Australia*, 4(1), 31-34.

Pearson, D. & Henryks, J., 2008. Marketing organic products: Exploring some of the pervasive issues, *Journal of Food Products Marketing*, 1(44), 95-108.

Pearson, D., Henryks, J., & Jones, H. 2011. Organic food: What we know (and do not know) about consumers. *Renewable Agriculture and Food Systems,* 26(2), 171-177.

Roberts, J.A., & Rundle-Thiele, S.R., 2007. Organic food: observations of Chinese purchasing behaviours. In The Australian and New Zealand Marketing Academy (ANZMAC) Conference 2007: 3Rs: Reputation, Responsibility & Relevance, December 3-5, 2007, Dunedin, New Zealand: 3430-3436.

Sirieix, L., Kledal, P., & Sulitang, T., 2011. Organic food consumers' trade-offs between local or imported, conventional or organic products: a qualitative study in Shanghai. *International Journal of Consumer Studies*, 35, 670-678.

Sue, V. M., & Ritter, L. A., 2007. *Conducting online surveys*. Sage Publications, Thousand Oaks, California.

Thøgersen J, Zhou Y, Huang G., 2015. How Stable is the Value Basis for Organic Food Consumption in China?, *Journal of Cleaner Production*, doi: 10.1016/j.jclepro.2015.06.036

Thøgersen, J., & Zhou, Y., 2012. Chinese consumers' adoption of a 'green' innovation – The case of organic food**.** *Journal of Marketing Management*, 28 (3-4), 313-333.

Van Doorn, J., & Verhoef, P.C., 2011. Willingness to pay for organic products: differences between virtue and vice foods. *International Journal of Research in Marketing*, 28 (3), 167-280.

Wu, L., Xu, L., & Gao, J., 2011. The acceptability of certified traceable food among Chinese consumers, *British Food Journal,* 113(4), 519-534.

Xia, W., & Zeng, Y., 2007. Consumer's attitudes and willingness-to-pay for Green food in Beijing. Paper presented at the 6th International Conference on Management (ICM), August 3-5, 2007, Wuhan, China, Vol. iii, Science Press.

Xia, W., & Zeng, Y., 2008. Consumer's Willingness to Pay for Organic Food in the Perspective of Meta-analysis. Paper presented at: International Conference on Applied Economics. ICOAE (pp. 933-943).

Xu, L., & Wu, L., 2010. Food Safety and consumer willingness to pay for certified traceable food in China, *Journal of Sci Food Agric*, 90, 1368-1373

Yin, S., Wu, L., Du, L. & Chen, M., 2010. Consumers' purchase intention of organic food in China. *Journal of the Science of Food and Agriculture*, 90, 1361-1367

Yiridoe, E., Bonti-Ankomah, S., & Martin, R., 2005. Comparison of consumer perceptions and preference toward organic versus conventionally produced foods; a review and update of the literature, Renewable Agriculture and Food Systems, 20 (4), 193-205.

Zhang, L., & Han, L., 2009. An analysis on consumer perception of safe food and purchase behaviour - a survey on fresh food in Shanghai. *Chinese Agricultural Science Bulletin*, 25 (4), 50-54.

Zhang, X., Huang, J., Qiu, G., & Huang, Z., 2010. A consumer segmentation study with regards to genetically modified food in urban China. *Food Policy*, 35, 456-462.

Zhou, Y.H., Huo, L., & Peng, X.J., 2004. Food Safety: Consumer attitudes, willingness to pay and the impact of information. *Chinese Rural Economy*, 11, 53-59.

Zhu, Q., Li, Y., Geng, Y., & Qi, Y., 2013. Green food consumption intention, behaviours and influencing factors among Chinese consumers. *Food Quality and Preference*, 28, 279-286.