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A Comparison of Attitudes Toward Food and Biotechnology in the U.S., Japan, and Italy

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Abstract

This research compares the attitudes of consumers in the United States, Italy and Japan toward food characteristics. The U.S. and Japanese consumers had relatively positive attitudes toward genetically modified food, while the Italian consumer had relatively negative attitudes. The Italian consumer was least likely to be familiar with genetically modified food. They rated organic higher than the U.S. consumer and they appeared to understand the meaning of the term organic better than the U.S. consumers. The U.S. and Japanese consumers were more concerned with freshness and value while the Italian consumers were concerned about the environment and local food.

Keywords: genetically modified food, organic, local, environmentally friendly

Introduction

A study by Vance Publishing in Fresh Trends 2001, found that American consumers felt it was appropriate to modify food items genetically to: be more resistant to plant disease and less reliant on pesticides, 70%; help prevent disease, 64%; improve nutritional value, 58%; improve flavor, 49%; and extend shelf life, 48%. By contrast, in the European Union (EU) the consumer generally views that genetically modified foods as unhealthy. A survey cited by the EU found that most Europeans see genetically modified food as health hazards, despite assurances from producers (Robert Wielaard, 2001). In November 1999, the European Commission passed a law requiring all European retailers to label food containing more than 1% genetically modified ingredients. The Commission also required restaurants to inform consumers if meals contained genetically modified ingredients. Similar to the EU, Japan requires the labeling of foods produced with genetically modified ingredients. According to the Ministry of Health, Labor and Welfare, the labeling of GM foods has been required in Japan since 2001 (The Ministry of Economy, Trade, and Industry, 2002)

The purpose of this research is to compare the attitudes of consumers in the United States, Italy and Japan toward food characteristics. Differences in attitudes between the U.S., Italian, and Japanese respondents concerning the following are examined in this research: organic food, genetically modified food, food labeling, locally grown food, environmentally grown, food grown in own country, food traceability, use of irradiation, and price.

Methodology

The research uses a survey instrument that was administered through the use of a personal interview during the fall of 2002 and winter of 2003 in the United States and in the winter of 2003 in Italy, and the spring of 2003 in Japan. The random sample of 550 food shoppers for the United States was collected in San Luis Obispo County, California. San Luis Obispo County was designated the best test market in the United States by Demographics Daily (Jackoway, 2001). San Luis Obispo was found to be the best of 3,141 counties to represent a microcosm of the United States based on 33 statistical indicators. The random sample of 200 food shoppers for Italy was collected in Modena, Italy during the winter of 2003. The random sample of 128 food shoppers for Japan was collected in Tokyo and Chiba, Japan during the spring of 2003.

Attitudes Toward Food

Attitudes toward Genetically Modified Foods

In order to examine general attitudes concerning the purchasing of genetically modified food, consumers were asked: "How likely are you to purchase a food product that has been genetically modified where definitely 5, probably 4, maybe = 3, probably not 2, and definitely not 1. It is important to note that this question is a general attitudinal question and is not used for forecasting the purchase probability of a specific product at a specific price. Tables 1 and 2 show that consumers in the U.S. and Japan both indicated a higher purchase probability than those in

Italy. The Italian consumer indicated, probably not, while the U.S. and Japanese consumers indicated probably not to maybe (Table 1).

Tables 3 and 4 show that the U.S. consumer was more familiar with genetically modified food than the Italian and Japanese consumers. Further, the Japanese consumer was less likely to be very or somewhat familiar with genetically modified food than the U.S. consumer (Table 3).
Tables 5 and 6 show that consumers in Italy, where there is mandatory labeling of genetically modified foods, indicated that labeling is more important to them than to consumers in the United States and Japan. Although Japan requires labeling, it was less important to Japanese consumers than to the Italian consumer and the U.S. consumer. A survey conducted by the Japanese government indicated that other labeling issues are more important to the Japanese (Quality-of-life Policy Bureau Consumer Policy Division, 2002)

Desirability Ratings of Food Characteristics

Consumers were asked to rate the desirability of nineteen characteristics of food to them when they make a decision to purchase food. They were asked the following question: "The following list shows features people may look for when they purchase food. Please indicate the desirability of each feature by giving me a number from one to five. Five means the feature is extremely desirable, three means it is somewhat desirable, and one means the feature is not desirable at all to you when you purchase food. If no single answer captures your feelings completely, please circle the closest number. Please try to use all the numbers in the scale."

Analysis of the mean ratings of the interval data in Table 7 indicates that there were many differences in the importance of individual characteristics to consumers in the U.S., Japan, and Italy. The superscripts show the ranking of the mean rating between countries for the attribute listed. The same superscript for two countries implies there is no difference in the mean rating of the attribute between the two countries. Fresh looking, fresh tasting and high quality were more important to consumers in the U.S. than to consumers in Italy and Japan. Fresh looking was equally important to consumers in Italy and Japan. Consumers in the U.S. indicated that a good value for the money was more important to them than consumers in Italy and Japan. However, U.S. and Japanese consumers rated inexpensive as a more desirable characteristic of food than consumers from Italy. The Italian consumers rated the environmental characteristics higher than consumers in the U.S. and Japan. The Italian consumers rated free of pesticides, good for the environment, grown in my local area, can be traced back to the processor and grower, and GMO free higher than consumers in the U.S. and Japan. Thus, it appears that the U.S. and Japanese consumers were more concerned with freshness and value of food products while the Italian consumers were concerned about the environment and the source of the food.

While Table 7 reports the mean ratings of the food characteristics, Table 8 generates a ranking of attributes based on the means. It is important to note that grown using biotechnology and genetically modified are the two lowest ranked characteristics for U.S. and Italian consumers. Grown using biotechnology is the second lowest characteristic for Japanese consumers and genetically modified is the eleventh characteristic. Thus, consumers in all of the countries rated the tangible characteristics of food such as those relating to freshness, quality, and price higher than the characteristics relating to the environment and biotechnology.

Meal and Food Purchasing Behavior

Table 9 shows whether consumers purchased organic products in the past year. In the attribute ratings, the Japanese and Italian consumers rated organic as more desirable than the U.S. consumer. A greater percentage of Japanese consumers purchased organic products in the past year. However, the U.S. and Italian consumers indicated a similar purchase incidence. Although the Japanese consumers were more likely to have purchased an organic product, Table 10 shows that the U.S. and Italian consumers purchased a greater variety of organic food products.

In research concerning organic lettuce, Wolf has shown that there appears to be confusion in consumers' understanding of the properties of organic food in the United States. For example in the examination of organic lettuce, it was found that consumers value the organic characteristics of lettuce such as environmentally friendly as somewhat to very desirable, while they rate organically grown and certified as only slightly to somewhat desirable. Thus, Wolf hypothesized that consumers do not understand the properties of organic foods (Wolf, 2002). This research has attempted to address the possible misconceptions of consumers by examining their responses to the question: "How strongly do you agree or disagree that all produce sold at a farmers' market is organic?" The farmers' markets in the research region in the United States were observed to sell primarily conventionally grown produce. Therefore, respondents that either agree or strongly agree are consumers that are likely confused about the attributes of organic produce. Since there were no farmers' markets in the areas where the research was conducted in Japan at the time, this question was excluded in the Japanese research. Almost a third of consumers in the Unites States agreed that all produce sold at farmers' market is organic. Only 18.5% of consumers in Italy agreed that all produce sold at farmers' market is organic. Therefore, it appears that the Italian consumer had a better understanding of organic food than the consumer in the United States. Perhaps the better understanding is related to why the Italian consumers rated the environmental characteristics higher than consumers in the U.S. and Japan.

Conclusions

A comparison of the U.S., Italian, and Japanese consumer indicated that there were many differences their attitudes toward food, organics, and the use of biotechnology in food production. The U.S. and Japanese consumers had relatively positive attitudes toward genetically modified food, while the Italian consumer had a relatively negative attitude toward genetically modified food. The Italian consumer was least likely to be familiar with genetically modified food. The Italian consumers rated organic higher than the U.S. consumer and they appeared to understand the meaning of the term organic better than the U.S. consumers.

The Italian consumers rated free of pesticides, good for the environment, grown in my local area, can be traced back to the processor and grower, and GMO free higher than consumers in the U.S. and Japan. The U.S. and Japanese consumers were more concerned with freshness and value of food products while the Italian consumers were concerned about the environment and the source of the food.

Tables

Table 1 Mean likelihood to purchase genetically modified food

	US	Italy	Japan	
	N=550	N=200	N=128	F
Likelihood to purchase genetically modified food	2.8336 [1]	2.095 [2]	2.6797 [1]	41.048**

Table 2 Tukey Post Hoc Likelihood of purchasing genetically modified food

		Mean Difference	Sig.
US	Italy	0.7386**	0
	Japan	0.154	0.252
Italy	US	-0.7386**	0
	Japan	-0.5847**	0

Table 3 Familiarity with Genetically Modified Food

Familiarity with Genetically Modified Food	COUNTRY			Total	Chi Square
	US	Italy	Japan		50.465**
Not at all familiar	21.40%	16.50%	4.00%	17.70%	
Not very familiar	37.80%	55.50%	62.70%	45.40%	
Somewhat familiar	32.70%	24.00%	31.70%	30.50%	
Very familiar	8.20%	4.00%	1.60%	6.30%	

** Significant at the .05 level

Table 4 Familiarity with GMO foods

	U.S.	Japan	Chi Square
Not at all	21.4%	4%	38.572 **
Not very familiar	37.8%	62.7%	
Somewhat familiar	32.7%	31.7%%	
Very familiar	8.2%	1.6%	

** Significant at the .05 level

Table 5 Importance of imposing mandatory labeling by government

Mandatory Labeling of Genetically Modified Food	**COUNTRY**			**Total**	**Chi Square**
	US	**Italy**	**Japan**		77.601**
Not at all important	4.20%	0.50%	15.00%	4.90%	
Not very important	14.90%	6.00%	15.00%	12.90%	
Somewhat important	36.40%	23.00%	20.50%	31.10%	
Very important	44.40%	70.50%	49.60%	51.10%	

** Significant at the .05 level

* Significant at the .10 level

Table 6 Importance of imposing mandatory labeling by government

	The U.S.	Japan	Chi Square
Not at all important	4.2 %	15%	24.706**
Not very important	14.9%	15%	
Somewhat important	36.4%	20.5%	
Very important	44.4%	49.6%	

** Significant at the .05 level

Table 7 Desirability characteristics of food

Food Characteristics	US[a]	Italy[a]	Japan[a]	F
fresh looking	4.6909[1]	4.26[2]	4.1484[2]	7.193**
fresh tasting	4.6909[1]	4.44[2]	4.2656[3]	23.809**
high quality	4.5428[1]	4.295[2]	3.6535[3]	59.415**
a good value for the money	4.3909[1]	3.72[3]	4.0313[2]	46.189**
high in nutrition	4.28[1]	3.93[2]	3.7559[2]	22.471**
Inexpensive	3.7527[1]	3.075[2]	3.7266[1]	30.564**
grown in my country	3.6764	3.725	3.7063	0.101
can be prepared quickly	3.6491[1]	3.405[2]	2.9681[3]	15.705**
free of pesticides	3.6436[2]	4.225[1]	3.874[2]	18.634**
good for the environment	3.5764[2]	3.89[1]	3.4016[2]	8.279**
grown in my local area	3.3418[2]	3.855[1]	3.1875[2]	17.818**
safe for the workman	3.3376	3.505	3.4766	1.543
can be traced back to the processor and grower	3.3164[2]	3.58[1]	3.0732[2]	6.496**
gourmet ingredients	2.8909[2]	3.365[1]	2.5556[3]	20.548**
irradiated to kill bacteria	2.8355[2]	1.95[3]	3.7583[1]	79.453**
organically grown	2.8309[2]	3.05[1]	3.1953[1]	5.654**
GMO free	2.7103[3]	4.065[1]	3.7344[2]	93.891**
grown using bio-technology	2.1985[2]	1.67[3]	2.8125[1]	42.376**
genetically modified	2.0348[2]	1.58[3]	3.5159[1]	127.086**

** Significant at the .05 level * Significant at the .10 level [a]Superscripts indicate differences at the .10 level based on Tukey Post Hoc test, different numbers indicate differenced. Same numbers indicate the same rating.

Table 8 Desirability ranking characteristics of food

Food Characteristics	US	Italy	Japan
fresh looking	1	3	2
fresh tasting	2	1	1
high quality	3	2	10
a good value for the money	4	10	3
high in nutrition	5	6	6
Inexpensive	6	15	8
grown in my country	7	9	9
can be prepared quickly	8	13	17
free of pesticides	9	4	4
good for the environment	10	7	13
grown in my local area	11	8	15
safe for the workman	12	12	12
can be traced back to the processor and grower	13	11	16
gourmet ingredients	14	14	19
irradiated to kill bacteria	15	17	5
organically grown	16	16	14
GMO free	17	5	7
grown using bio-technology	18	18	18
genetically modified	19	19	11

Table 9 Have purchased organic in the past year

	COUNTRY			Total	Chi Square
	US	Italy	Japan		6.04**
Have purchased organic	66.20%	63.00%	75.80%	66.90%	

** Significant at the .05 level

Table 10 Types of organic food purchased

	COUNTRY			Total	Chi Square
	US	Italy	Japan		
Meats	20.90%	21.50%	9.40%	19.40%	9.606**
Milk	28.20%	33.50%	21.90%	28.50%	5.241*
Other dairy products (excluding Milk)	23.80%	28.00%	6.30%	22.20%	23.576**
Fresh fruits	62.2%	44.50%	39.8	10.40%	31.426**
Fresh vegetables	62.70%	38.00%	71.10%	58.30%	46.958**
Wine	14.00%	13.00%	8.60%	13.00%	2.688
Bakery items (Including bread)	21.80%	23.50%	25.80%	22.80%	1.004
Other	16.90%	16.50%	8.60%	15.60%	5.61*

** Significant at the .05 level

Table 11 All produce products sold at farmers' markets are organic

	COUNTRY		Total	Chi Square
	US	**Italy**		12.463**
Strongly disagree	18.00%	23.00%	19.40%	
Disagree	50.60%	58.50%	52.70%	
Agree	27.30%	15.50%	24.20%	
Strongly Agree	4.00%	3.00%	3.70%	

** Significant at the .05 level

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