



Consumer Behavior on Full-fatted Soybean-based Food Products as Meat Alternatives among Residents of Baguio City and Benguet Province

Rodeliza A. Flores, Rochelle B. Quintos, Pelin B. Belino*, Amelia G. Bawang,
Florida S. Rosario, Dalifer A. Gano, and Maravilla M. Senado

College Home Economics and Technology, Benguet State University

*Corresponding author email address: p.belino@bsu.edu.ph

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Abstract

Plant-based foods such as soybean products are becoming popular to consumers because of environmental concerns and health and wellness. Soybean is a valuable source of nutrients and other functional health benefits. A quantitative descriptive consumer behavior survey on full-fatted soybean-based food products as meat alternatives was conducted among 395 consumer-respondents from Baguio City and Benguet Province. Regardless of socio-demographic background, most respondents indicated their willingness to purchase soybean-based products when available in the market. They will likely purchase 0.5kg to 2kg per week and consume these products once to twice a week. Educational level and household size were found to be significantly associated with the intended amount of purchase, while age is significantly associated with the intended frequency of consumption. Expectations on the quality of the product to include freshness and quantity per pack, and their health condition in terms of psychological (individual) factors; taste in terms of the sensory (product-specific) factors; and price in terms of the marketing (environmental) factors are the major factors that will highly influence the preference and purchase of soybean-based food products as meat alternatives among consumers in Baguio City and Benguet Province. Other factors that will influence the purchase of the products include texture, availability and accessibility, and aroma of the products. Nutritional value, health benefits, affordability, and taste are the top criteria that will satisfy the consumers with soybean-based food products as a meat alternative.

Introduction

Soybean (*Glycine max*) is a nutritious food and is a crop of global importance. It has a wide range of geographical adaptation, unique chemical composition, good nutritional value, and

functional health benefits (Singh, 2010). It is an exceptional source of essential nutrients needed by the body (Dolojan et al., 2015). It contains protein necessary for the growth and maintenance of cells and tissues, carbohydrates that provide energy, minimum saturated fats that may help

prevent cardiovascular diseases, phytochemicals that prevent cancer, and vitamins and minerals that boost overall health promotion. Consumers are increasingly aware of the healthfulness of soy-based foods.

The Department of Agriculture emphasized in their research and development initiative that soybean is one of the most versatile among the high-value crops that can help solve the chronic problems of hunger and malnutrition. The Department of Agriculture plans to expand soybean production in the Philippines. The soybean road map aims to establish knowledge-based and farmer-friendly research facilities for soybean production and its product development in the strategic areas in the country (Aquino et al., 2018).

Soybeans are valuable raw materials for food as meat alternatives. Animal meat production is associated with a range of important global problems, including greenhouse gas emissions, deforestation, and freshwater consumption (Mc Michael et al., 2007 as cited by Bryant et al., 2019). A plant-based diet would require significantly fewer environmental resources per calorie than a meat-based diet (Hoek, 2010). According to Aiking et al. (2006), as cited by Hoek (2010), 2 to 15kg plant foods are needed to produce 1kg meat. As such, if people eat plant foods directly, lesser resources are required for production. Concerning health and nutrition, animal meats are rich sources of complete proteins but contain saturated fats and cholesterol, which increase the risk of developing cardiovascular diseases. Diets high in saturated fats appear to increase the risk of developing some forms of cancer. Epidemiological studies have reported positive associations between high red meat consumption and the risk of developing colorectal cancer, cardiovascular diseases, and diabetes (Smet et al., 2019). Plant-based foods such as soybean-based food products as meat alternatives may play an essential role in having a healthy diet.

Food and food choice are important components of managing these health and environmental problems. Food choice influences the health and well-being of individuals, families, and communities (Roudsari et al., 2017). However, we have to understand that many factors affect consumer food choice and acceptance of food products. As indicated by Meiselman (2008) as cited by Hoek (2010), food choice is influenced by

several factors such as sensory, physiological, and social factors. A study on soyfood consumption patterns, including meat alternatives, was conducted by Rimal et al. (2007) in the U.S. Their study showed that consumers considered the convenience of preparation and consumption, health benefits, and taste important product attributes of soyfood products. However, the study did not include other aspects affecting consumer behavior on soybean-based food products. Consumers are the final step in the food production chain; hence, it is useful to identify which factors affect their behavioral patterns.

The 2013 Philippine Food Consumption Survey conducted among households by the Food and Nutrition Research and Institute [FNRI] (2015) of the Department of Science and Technology showed that the food group least consumed was legumes, nuts, and seeds like beans, peas, lentils, and processed foods made from these. In the Cordillera Administration Region (CAR), 50.2% of households did not consume legumes. The 2013 National Nutrition Survey showed that the CAR has the third-highest prevalence in total cholesterol at 23.4% of adults, with a national prevalence of 18.6%. Legumes, including soybeans, are good sources of protein with low saturated fat and cholesterol-free that are best used as meat alternatives, especially for people at risk of cardiovascular diseases. Intake of soyfood products has been shown to have beneficial effects on cardiovascular disease risk factors. Thus, this study was conducted to understand consumer behavior towards soybean-based products among residents in the region, particularly in Baguio City and Benguet Province. Results of the study would serve as bases in the development and formulation of full-fatted soybean-based meat alternative products to satisfy consumer expectations, demands, and nutritional needs. Specifically, the study 1) determined the influence of socio-demographic background (sex, age, income, educational level, household size) of consumer-respondents and the intended amount to purchase and the frequency of consumption of full-fatted soybean-based products as a meat alternative; 2) determined the level of influence on the preference and purchase of soybean-based products as meat alternatives as perceived by the consumer-respondents in terms of psychological (individual) factors, sensory (product-specific) factors, and marketing (environment) factors;



and 3) identified other criteria considered by the consumer-respondents in their purchase of soybean-based food products as a meat alternative.

The Multidisciplinary Model of the Main Factors Affecting Consumer Behavior in a Food Domain

The framework developed by Font-i-Furnols and Guerrero (2014) that explains the different factors that affect consumer behavior in the food domain was considered in this study. The model consists of three main factors; psychological (individual factor), sensory (product-specific factor), and marketing (environment factor), which are divided into subgroups factors. The consumer decision-making process is relatively complicated and varies between individuals. Hence this study is conducted to understand the influence of these factors towards the preference and purchase of the full-fatted soybean-based food products as meat alternatives.

The psychological factors include beliefs and attitudes, risks, expectations, socio-cultural effects, lifestyle, and values. Beliefs are founded on experiences or acquired knowledge and the personal characteristics that determine consumer attitudes, buying intentions, and preferences (Friedler & Bless, 2000 cited by Font-i-Furnols & Guerrero, 2014). Attitudes refer to the feelings and evaluation towards an object, issue, or event (Fisbein & Azjen, 1975 as cited by Font-i-Furnols & Guerrero, 2014). Consumers' perception and behavior are influenced by the attitudes and beliefs that a consumer has towards a product, how it is produced, handled, or distributed. Attitudes affect consumers' intention to buy a specific product (Mousel & Tang, 2016). Expectations are anticipations concerning the likelihood of something to happen, based on previous experience and knowledge. Socio-cultural variables contribute to food selection and eating practices that affect purchasing behaviors (Roudsari et al., 2017). Consumers have their lifestyles and values that influence how they perform activities and identify themselves (Font-i-Furnols & Guerrero, 2014 cited by Moradian & Rosand, 2019). Thus, the perceived effects of these factors on the willingness of respondents to purchase the soybean-based meat alternatives were considered in this study.

The sensory factors, particularly the visual appearance, in-mouth texture, flavor, and odor, are the major determinants of consumer behavior. Different consumers have diverse preferences among the sensory factors, depending on parameters such as nutrition and age. Visual appearance, especially color, is considered the most important because it helps determine whether or not the food is fresh. The in-mouth texture refers to factors such as juiciness, softness, and chewiness (Font-i-Furnols & Guerrero, 2014 cited by Moradian & Rosand, 2019). The perceived effects of these sensory factors among consumer respondents on their preference and willingness to purchase soybean-based products were also included in this study. Understanding the perception of consumers on the sensory properties will be of great help in the product development of soybean-based products to be made available in the market.

Information regarding the products is provided through advertising or marketing campaigns, labels, or brands. Consumers use this information to create their quality expectations, which in turn influence their choice of the product and their purchasing decisions and willingness to pay (Font-i-Furnols & Guerrero, 2014). Hence, in this study, the perceived influence of advertising or marketing campaigns on the purchase of soybean-based food products was asked from the respondents. Furthermore, the respondents were asked if they check on food labels, especially on the nutritional value of the food products.

The marketing factors include price, quality labeling, brand, and availability. The information gained through these factors has a direct effect on psychological factors such as expected quality. Price is an important extrinsic quality cue related to the consumers' purchasing decisions. Accordingly, the price of a product directly affects the expected quality of a product. High prices provide the perception of high quality (Font-i-Furnols & Guerrero, 2014 as cited by Moradian & Rosand, 2019).

Conceptual Framework

This study focused on aspects that may influence consumer behavior, preferences, and perceptions of soybean-based products as meat alternatives with respect to psychological, sensory, and marketing aspects. The multidisciplinary



model of the main factors affecting consumer behavior of Font-i-Furnols and Guerrero (2014) was adapted and modified (Figure 1). It considered the influence of psychological or individual factors, particularly socio-demographic characteristics, including age, sex, income, occupation, educational level, and household size; the expectations on the quality of the product and the quantity per pack; and lifestyle, personality, and values related to the health condition. The sensory factors that were considered to influence the preference and purchase of soybean-based products include visual appearance (color), texture, flavor (taste), and aroma. The marketing-related factors include the price and the availability, and accessibility of the product in the market. Other marketing-related aspects, particularly advertising or market campaigns and labeling, were also considered in the study.

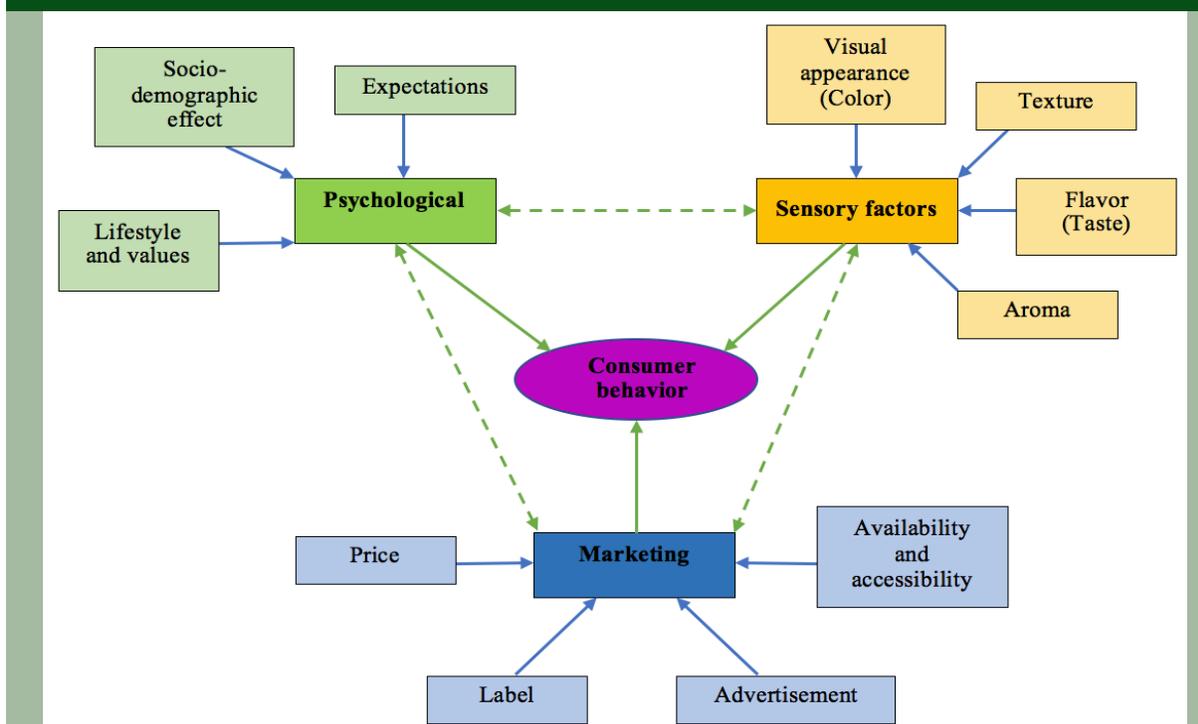
information on the behavior of consumer respondents towards full-fatted soybean-based meat alternatives. It made use of a structured survey questionnaire with two parts. The first part of the survey questionnaire contains questions related to socio-demographics, including sex, age, occupation, income, educational level, and household size. The second part of the questionnaire deals with the respondent's perception and willingness to purchase soybean-based products, particularly burger patty, *longganisa*, and meatballs (using soybeans) as meat alternatives if available in the market. Respondents who considered buying the soybean-based products were further asked the probable amount to be consumed and the frequency of consumption per week. The respondents were also asked to rate how psychological (individual) factors, sensory (product-specific) factors, and marketing (environment) factors influence their preference and purchase of soybean-based food products. Likewise, other aspects and criteria considered by the consumer-respondents in the purchase of soybean-based meat alternatives were asked.

Methodology

The study employed quantitative descriptive research, particularly a survey, to gather

Figure 1

Conceptual Framework of the Study (adapted and modified from Font-i-Furnols & Guerrero, 2014)



Cross-sectional data was collected from 395 respondents residing in Baguio City and in Benguet Province. These respondents were selected using non-probability sampling technique. Respondents were drawn from the population close to hand. No incentives were given to the participants. The data were collected through an online survey using Google Forms and face-to-face interviews. For the online survey, the forms were sent to the participants. The survey was conducted from December 2019 to January 2020.

Chi-square test was used to determine the relationship between the socio-demographic characteristics (sex, age, income, educational level, and household size) of consumer-respondents and the intended amount to purchase and the frequency of consumption of full-fatted soybean-based products. Descriptive statistics, mainly frequency distribution and percentages, were also used to analyze and present the data, particularly on the perceived level of influence of the psychological, sensory, and marketing factors on the preference and purchase of soybean-based products among consumer respondents.

Results and Discussion

Socio-Demographic Characteristics of Respondents

Of the 395 respondents, 75% are Benguet residents, and 25% are from Baguio City; 65% are female, and 35% are male. Most of the respondents are aging 12-35 years old. Almost half (49%) of the respondents are either employed (36%) or self-employed (8%). Most of the respondents finished tertiary or college level (69%). Their monthly household income ranged from Php9,000.00 to Php115,000.00. Majority of the respondents have a household size of 4-6 members (54%) (Table 1).

Influence of Socio-Demographic Factors on the Purchase and Consumption of Soybean-based Food Products

Purchase of Soybean-based Food Products as Meat Alternatives

The respondents were asked whether they would purchase soybean-based food products

Table 1

Socio-demographic Profile of Respondents, Benguet and Baguio City, 2020 (n=395)

Characteristics	Percentage (%)
<i>Residence</i>	
Baguio City	25
Benguet	75
<i>Sex</i>	
Male	35
Female	65
<i>Age</i>	
12-19 years old	30
20-35 years old	59
36-50 years old	7
51 and above years old	4
<i>Occupation</i>	
Employed	36
Self-employed	8
Entrepreneur	5
Students	38
Unemployed	10
Others	3
<i>Highest Educational Attainment</i>	
None	1
Secondary	12
Vocational	14
Tertiary	69
Master's Degree	3
Doctorate Degree	1
<i>Household Size</i>	
1-3 members	21
4-6 members	54
7-9 members	22
10 and above members	3
<i>Monthly Household Income</i>	
Less than Php9,000.00	29
Php10,000.00-Php19,000.00	28
Php20,000.00-Php38,000.00	23
Php39,000.00-Php66,000.00	14
Php67,000.00-Php115,000.00	5
More than Php 115,000.00	0.8
Others	0.2

when available in the market. The survey showed that the majority would buy the three products; namely, burger patty (81%), meatballs (80%), and longganisa (77%), when available in the market. The respondents were also asked about the amount in kilograms of soybean-based products they will consume weekly. It is noteworthy to know that most of the respondents (86%



combined) indicated they would be consuming one-half kilogram to two kilograms in a week of soybean-based food products (Table 2).

Socio-Demographic Background and the Intended Amount to Purchase Per Week

Table 3 presents the socio-demographic background of consumer-respondents and the intended amount of purchase per week. Results of the Chi-square test show that there is a significant association between educational level ($P=.02$) and household size ($P<.001$) and the intended amount to purchase per week. These results show that consumer-respondents who are better educated and have smaller household sizes intend to buy more soybean-based products as meat alternatives. It is noted that most of the respondents in this study have formal education who have the capacity to make healthy food choices. This finding supports the study of Bryant et al. (2019), which showed that the more educated groups in India expressed more intent to purchase plant-based meat alternatives. Moorman and Matulich (1993), cited by Prasad et al. (2008), hypothesized that education encourages most types of health information acquisition behaviors. Similarly, the study of Divine and Lepisto (2005), cited by Prasad et al. (2008), concludes that being better educated is a significant predictor of a healthier lifestyle. Thus, Prasad and co-workers suggest that marketers indicate promotional nutritional messages and use informative advertising to convince target consumers to purchase more nutritious foods. Their results indicate that health information transforms into purchase behavior for healthy food. On the other hand, household size impacts the capacity to purchase not only the quantity but also the quality of foods. Hoek et al. (2004) reported a trend of both vegetarians and

consumers of meat substitutes among smaller households, higher education levels, and higher socio-economic status relative to meat consumers.

Demographics, including age, sex, education, occupation, and income, affect food selection, eating practices, and purchasing behaviors of individuals (Roudsari et al., 2017). Key demographic characteristics such as income and age determine consumer needs. One of Charles Schaninger's (Distinguished of Professor of Marketing) generalizations, as cited by Kardes et al. (2015), is that income is an adequate predictor of consumer behavior for expenditures that do not reflect lifestyle or values and that affordability is the key. Consumers of various ages seek different solutions to similar problems, which provide rich opportunities for marketers to design age-relevant products (Kardes et al., 2015).

As regards to sex, Bryant et al. (2019), in their study in China, found that women are more likely to buy plant-based meat than men. This result is consistent with the findings of Hoek et al. (2004) that the vegetarian group consisted of a higher percentage of women compared to meat consumers. Interestingly, they found that meat-eaters are significantly more likely than vegetarians and vegans to buy plant-based meat, and higher meat attachments predict higher purchase likelihood. Higher familiarity and lower food neophobia are found to be predictive of purchase intent. Likewise, Mousel and Tang (2016) found sex to be the only socio-demographic factor that significantly influences the intention to buy plant-based alternatives among Swedish consumers.

Socio-Demographic Background and the Intended Frequency of Consumption Per Week

The respondents were likewise asked about the intended frequency of consumption of soybean-based products. Most (339, 86%) of the consumer respondents indicated that they would be consuming the soybean-based products once (170, 43%) to twice (169, 42.8%) a week (Table 4). Some (14%) responded that they would consume the products thrice a week. Using the Chi-square test to determine if there is a relationship between the socio-demographic profile and the intended frequency of consumption, only the age of consumer-respondents was highly significant ($P<.001$). Results showed an increased intended frequency of consumption, twice to thrice a week among

Table 2

Amount (kg) of Soybean-based Food Products to be Purchased in a Week, Benguet and Baguio City, 2020 (n=395)

Amount	Frequency	Percentage (%)
500 grams or ½ kg	169	43
1-2 kg	169	43
3-4 kg	56	14
5 kg and above	1	0



Table 3

Association of Socio-demographic Profile and Intended amount of purchase per week Benguet and Baguio City, 2020 (n=395)

Characteristics	N	Amount to purchase per week				X ²	SIG
		500g	1-2 kg	3-4 kg	5kg & above		
<i>Sex</i>							
Male	138	61	51	26	0	5.97 ^{ns}	0.113
Female	257	109	118	29	1		
	395	170	169	55	1		
<i>Age</i>							
12-19 years old	119	43	59	17	0	15.623 ^{ns}	0.075
20-35 years old	232	113	86	32	1		
36-50 years old	28	10	12	6	0		
51 and above years old	16	4	12	0	0		
	395	170	169	55	1		
<i>Income</i>							
Less than Php9,000.00	115	44	56	14	1	24.843 ^{ns}	0.287
Php10,000.00-Php19,000.00	110	46	46	18	0		
Php20,000.00-Php38,000.00	92	52	30	10	0		
Php39,000.00-Php66,000.00	54	19	27	8	0		
Php67,000.00-Php115,000.00	20	9	6	5	0		
More than Php 115,000.00	3	0	3	0	0		
Others	1	0	1	0	0		
	395	170	169	55	1		
<i>Educational Level</i>							
None	2	0	2	0	0	31.894*	0.023
Elementary	0	0	0	0	0		
Secondary	6	1	1	4	0		
Senior High	43	14	28	1	0		
Vocational	55	24	22	9	0		
Bachelor's Degree	274	125	111	37	1		
Master's Degree	13	5	4	4	0		
Doctorate Degree	2	1	1	0	0		
	395	170	169	55	1		
<i>Household Size</i>							
1-3 members	82	39	29	14	0	38.389**	0.000
4-6 members	212	82	98	32	0		
7-9 members	89	44	37	8	0		
10 and above members	12	5	5	1	1		
	395	170	169	55	1		

** highly significant; * significant; ^{ns} not significant

those aging 20-51 years old. This result implies that the older respondents will likely consume soybean-based food products as meat alternatives more frequently. This result is consistent with Rimal et al. (2007), who reported that households' and respondents' socio-economic characteristics played a significant role in the consumption

frequency of soybean food products. The older respondents consumed soy milk, soy supplement, and soy cheese more frequently. This could be explained by having a better understanding of the health and nutritional benefits of soybean-based products. Older consumers tend to be more health-conscious than younger consumers.



Table 4*Association of Demographic Profile and the Intended Frequency of Consumption Per Week*

Characteristics	N	Frequency of Consumption Per Week				X ²	SIG
		Once	Twice	Thrice	Daily		
<i>Sex</i>							
Male	138	58	60	19	1	1.940 ^{ns}	0.585
Female	257	112	109	36	0		
	395	170	169	55	1		
<i>Age</i>							
12-19 years old	119	68	38	13	0	28.432 ^{ns}	0.001
20-35 years old	232	88	110	34	0		
36-50 years old	28	9	12	6	1		
51 and above years old	16	5	9	2	0		
	395	170	169	55	1		
<i>Income</i>							
Less than Php9,000.00	115	40	51	24	0	23.919 ^{ns}	0.158
Php10,000.00-Php19,000.00	110	41	53	15	1		
Php20,000.00-Php38,000.00	92	52	33	7	0		
Php39,000.00-Php66,000.00	54	23	26	5	0		
Php67,000.00-Php115,000.00	20	12	5	3	0		
More than Php 115,000.00	3	1	1	1	1		
Others	1	1	0	0	0		
	395	170	169	55	1		
<i>Educational Level</i>							
None	2	1	1	0	0	22.045 ^{ns}	0.230
Elementary	0	0	0	0	0		
Secondary	6	3	0	0	0		
Senior High	43	24	15	4	0		
Vocational	55	16	33	5	1		
Bachelor's Degree	274	119	112	43	0		
Master's Degree	13	7	4	2	0		
Doctorate Degree	2	0	1	1	0		
	395	170	169	55	1		
<i>Household Size</i>							
1-3 members	82	34	30	18	0	8.907 ^{ns}	0.446
4-6 members	212	91	92	28	1		
7-9 members	89	38	43	8	0		
10 and above members	12	7	4	1	0		
	395	170	169	55	1		

* significant; ^{ns} not significant

Perceived Effect of Factors that Influence Consumer Preference and Purchase of Soybean-based Products as Meat Alternatives

Psychological (Individual) Factors

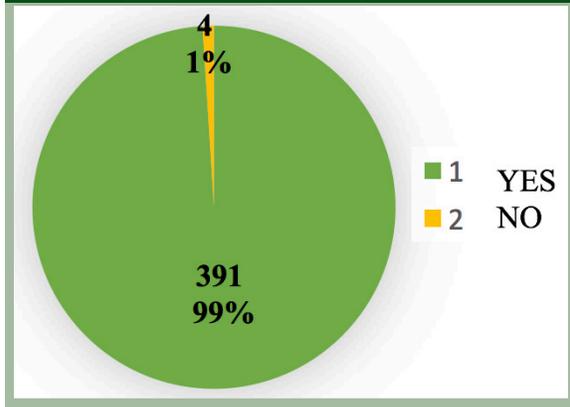
This study shows that 99% of the respondents indicated they would purchase soybean-based

meat alternatives when available in the market (Figure 2). Only one percent responded otherwise. However, it must be noted that intention to buy is distinct from the actual action to buy. Many consumers who say they are interested in buying do not follow through with their intentions. The consumer-respondents were then asked about their perception of the level of influence of these psycho-socio-cultural factors (income, occupation,



Figure 2

Willingness to Buy Soybean-based Products as a Meat Alternative, 2019-2020, Baguio City and Benguet Province (n=395)



lifestyle, personality, health condition) on their preference and purchase of soybean-based products as a meat alternative.

Income. Respondents were asked about the perceived effect of income on their willingness to buy soybean-based products. Most of the respondents indicated that their income would affect their preference or purchase of soybean-based meat alternatives (Figure 3a). In the study of Bryant et al. (2019) in India, higher-income groups expressed more intent to purchase plant-based meat. Similarly, Prasad et al. (2008) show that the higher income a household has, the more health-conscious the household is. This finding is consistent with Moorman and Matulich (1993), as cited by Prasad et al. (2008), that income positively affects health behavior. An explanation is that low income can constrain a household's ability to engage in health-conscious behavior.

Occupation. On the perceived influence of occupation on the purchase of soybean-based food products, the majority of the respondents indicated that their occupation would moderately to highly affect their preference or purchase of soybean-based food products (Figure 3b). Roudsari et al. (2017) reported that job-related food constraints are an important influencing factor for food choice. The occupation of their study participants has a great impact on their food choice. If their job and working hours are not attuned to healthy eating, they are forced to eat fast foods. Indeed, time constraints in preparing healthy meals will affect foods to serve

in the household. This factor should be considered in developing soybean-based food products so that these meat alternatives should require minimal preparation.

Lifestyle. Another personal factor that might affect the preference or purchase decision of the consumer-respondents is lifestyle. Lifestyle, as defined in this study, refers to how a person lives, including his or her interests, and behavioral orientation. The data shows that most respondents indicated that their lifestyle would affect their preference or purchase of soybean-based food products. Only 7% indicated that lifestyle would not affect their preference or purchase decision in buying the products if available in the market (Figure 3c).

Food-related lifestyles were studied by Hoek et al. (2004) to assess the attitudes to food among vegetarians, consumers of meat substitutes, and meat consumers using the food-related lifestyle instrument. They found that vegetarians had more positive attitudes towards the importance of product information, health, novelty, and ecological products than meat consumers. Vegetarians had positive attitudes towards shopping in specialty shops and have a high preference for ecological products. Meat substitute consumers displayed higher scores on price-quality relation than meat consumers.

Personality. Personality is a set of unique psychological characteristics that influences how people respond to their environment, including cognitive, affective, and behavioral tendencies. Personality is molded by different experiences and interactions that a person encounters; thus, attitudes are the main part of one's personality (Upen, 2018). Product developers need to understand consumer personalities to help predict their responses to marketing activities. However, as indicated by previous researchers, people do not necessarily behave the same way in all situations, and that an individual's personality can change over time. Accordingly, consumers' personalities mature along with their physical growth (Kardes et al., 2015).

The study showed that personality is a factor in the respondents' preference and purchase of soybean-based meat alternatives. Thirty-five percent of the respondents perceived that it would affect their preference moderately; 32% indicated it would highly affect their preference



or purchase. Only 12% perceived that their personality would not affect their preference or purchase (Figure 3d).

In the study of Bryant et al. (2019) in the USA, meat attachment was found to be a negative predictor of acceptance, indicating that those who are especially attached to meat are unlikely to buy plant-based meat. This finding contradicts what they found in India and China, where omnivores and those who eat more meat are more likely to eat plant-based meat. Attitudinal predictors for the purchase intent of plant-based include appeal, excitement, and low disgust among study participants in the USA. For China participants, the critical attitudinal predictors of purchase intent were perceived healthiness, appeal, tastiness, and sustainability as a long-term food source. In India, in terms of attitude, perceived sustainability, excitement, necessity, and goodness were seen to be the predictors of plant-based meat purchase.

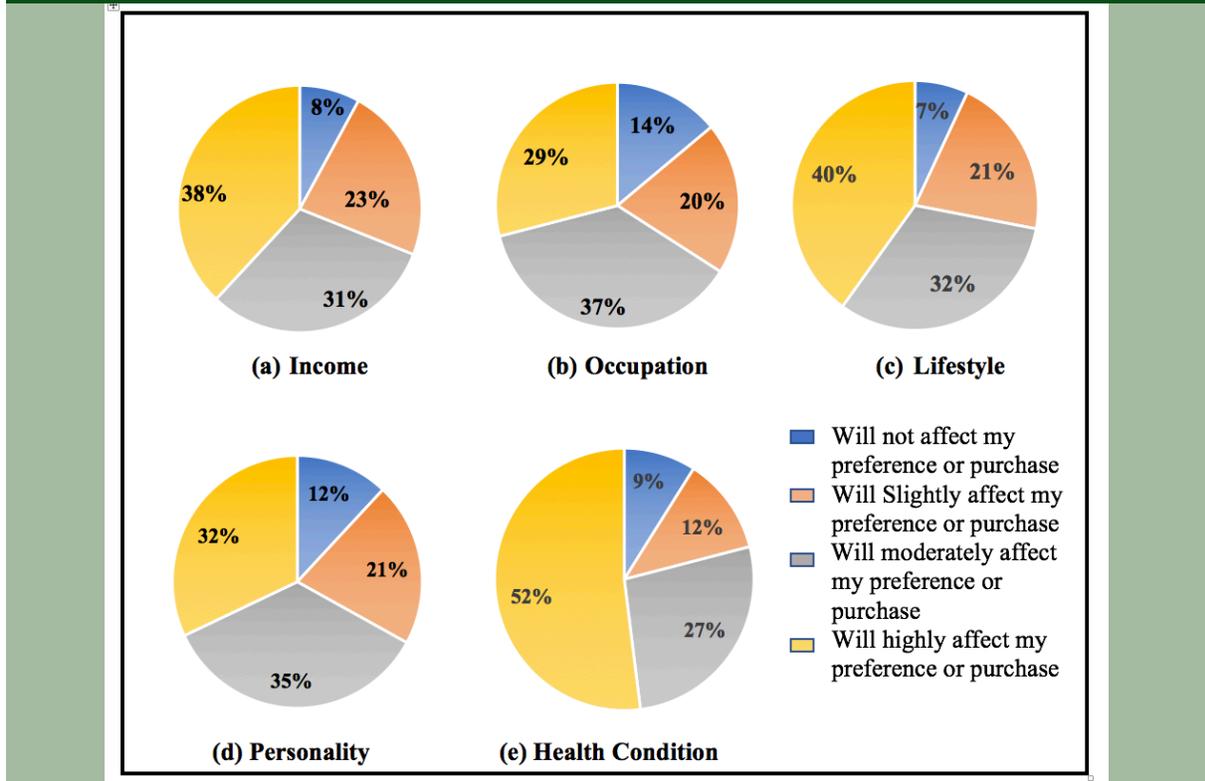
Weinrich (2019) considers perception critical for consumers to develop a positive attitude towards novel meat substitutes. The researcher further concludes that personal characteristics cannot be changed easily and that repeated consumption is necessary to form a favorable attitude towards these meat substitutes. Positive persuasion drivers to influence consumers to try meat substitutes include benefits on health, environmental, and animal welfare aspects.

Health Condition. As defined by the World Health Organization, health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. As used in this study, health condition refers to the general condition or state of body and mind based on the individual's self-evaluation. Results show that 52% of the respondents indicated that their health condition would highly affect their preference or purchase (Figure 3e).

Many consumers place a high value on

Figure 3

Perceived Effect of Psychological (Individual) Factors on Willingness to Purchase Soybean-based Meat Alternatives, 2019-2020, Baguio City and Benguet Province (n=395)



health due to self-esteem and concerns about longevity and survival. Consumers value health as reflected in the popularity of foods low in fat, calories, carbohydrates, salt, sugar, cholesterol, and foods with special nutritional benefits (Hoyer et al., 2013). Attitudes to health assessed by the health consciousness scale showed that vegetarians are more occupied by health. Health was considered an important quality aspect by vegetarians than meat consumers (Hoek et al., 2004). With these results, it is important to understand that with proper education and information about healthy foods, such as this soybean-based meat alternatives, our prospective consumers may consider buying the product when made available in the market.

Expectations on the Quality of the Product

One important psychological aspect of consumer behavior in a food domain is consumer expectation. According to Font-i-Furnols & Guerrero (2014), expectations are important factors determining whether or not a person adopts or rejects a product. High expectations result in a higher chance of product adoption. Expectations on quality are the most crucial factors influencing purchase decisions. In this survey, the aspect of quality, specifically on the freshness of the product, was considered.

Freshness of Product. Freshness refers to the state of being recently made. It relates directly

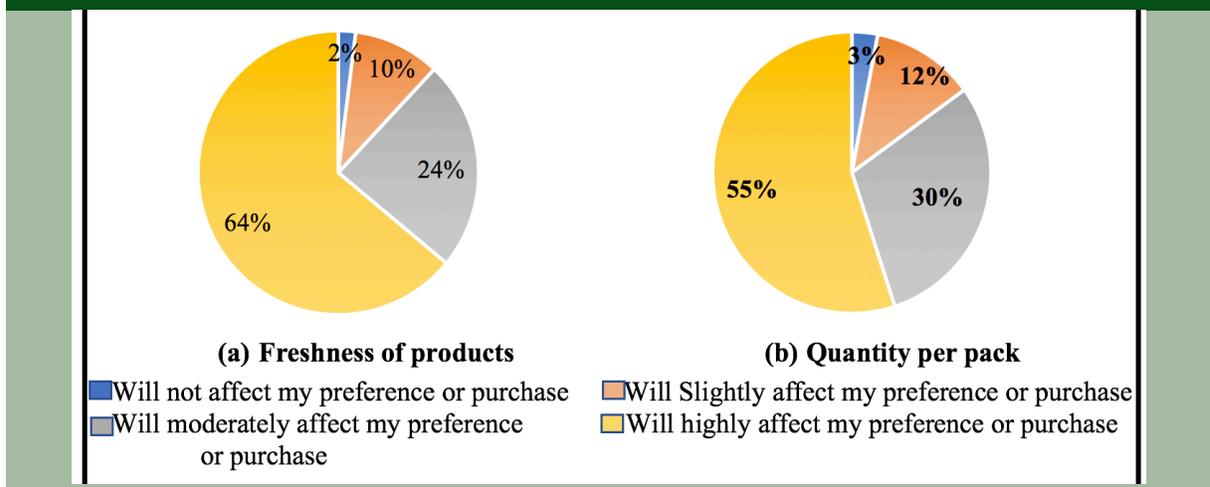
to how far away in time the product is from the moment it was made. Results of the study show how important the freshness of the product is to consumers. A high percentage (64%) of the respondents considered freshness a very important factor in purchasing the products (Figure 4a).

Quantity Per Pack. Figure 4b shows that 55% percent of the respondents' preference or purchase would be highly affected by the quantity per pack of the product. The respondents were asked about the preferred quantity per pack of soybean-based products when available in the market. As shown in Table 5, 65.6% of the respondents prefer that the products be packed by 0.5kg. Some (29.6%) want these products to be packed by one kilogram. These results should then be considered in the packaging of soybean-based products to be developed and marketed.

Table 5
Preferred Packaging (Quantity Per Pack) of Soybean-Based Products, 2019-2020, Baguio City and Benguet Province (n=395)

Quantity/pack	Frequency	Percentage
½ kg	259	65.6%
1kg	117	29.6%
Others, pls. specify	19	4.8%

Figure 4
Perceived Effect of Product Quality Expectations on Willingness to Purchase Soybean-based Meat Alternatives, 2019-2020, Baguio City and Benguet Province (n=395)



Sensory (Product-Specific) Qualities

The importance of sensory perception to food quality is widely appreciated in the food industry. The sensory properties, including appearance, color, texture, aroma, and taste of food products, are important determinants of food acceptance and choice (Meiselman, 1996). Consumer respondents were asked about the perceived effect of these sensory qualities on the preference and purchase of soybean-based food products as meat alternatives. Soybean-based product developers can use these results in the development of better quality soybean-based products as meat alternatives.

Visual Appearance-Color. Color is the primary element seen in food products that set consumers' perception of taste and overall product acceptance (Spence, 2015). The study showed that of the 395 consumer respondents, 41% perceived that the visual appearance, particularly the color presentation of the soybean-based food products, will highly affect their preference or purchase. Only 11% indicated that color would not affect their preference at all (Figure 5a). Elzerman et al. (2011) showed that for meat substitutes to be accepted, especially among vegetarian consumers, appearance is important. Likewise, Weinrich (2019) indicated that a delightful appearance and a good perception of appearance are essential in persuading consumers to adopt meat substitutes.

Texture. The texture is an attribute of a substance resulting from a combination of physical properties and perception of touch, sight, and hearing. It is the sensory manifestation of the structure or inner makeup of products in terms of their mechanical, geometrical and moisture properties (Villarino, 2020). In this survey, 49% of the respondents perceived their purchase or preference would be highly affected, 33% will be moderately affected, and 13% will be slightly affected by the texture of soybean-based food products (Figure 5b). This result is similar to the study of Hoek et al. (2011) that texture is an important consideration in consumers' preference for meat substitutes. Respondents who do not usually use meat substitutes indicated their preference for products with meat-like texture, while heavy-users prefer meat substitutes less similar to meat. In this study,

whether a consumer was a user and non-user of meat substitutes was not considered since soybean-based meat substitutes are not common in the area. The study assumed it would be best to develop soybean-based products with meat-like textures that consumers are familiar with.

Taste. The 'taste of food' plays a vital role in food choice. Pleasant taste is the main ingredient for repeated consumption of meat substitutes (Weinrich, 2019). Results showed that 64% of the respondents indicated that taste would highly affect their preference or purchase of soybean-based food products (Figure 5c). The study results are consistent with previous studies that delectable taste is the key to lower the barriers in consuming plant-based diets. Rimal et al. (2007) reported that tastefulness was essential to increase consumption frequency for soyfood products, including tofu, vegetable burgers, and meat substitutes. Moradian and Rosand (2019) also reported that food industry companies have to create the taste and texture of their plant-based products identical to the qualities of meat to influence flexitarians to transition towards a plant-based diet. A positive perception of the taste of meat substitutes is essential to persuade consumers.

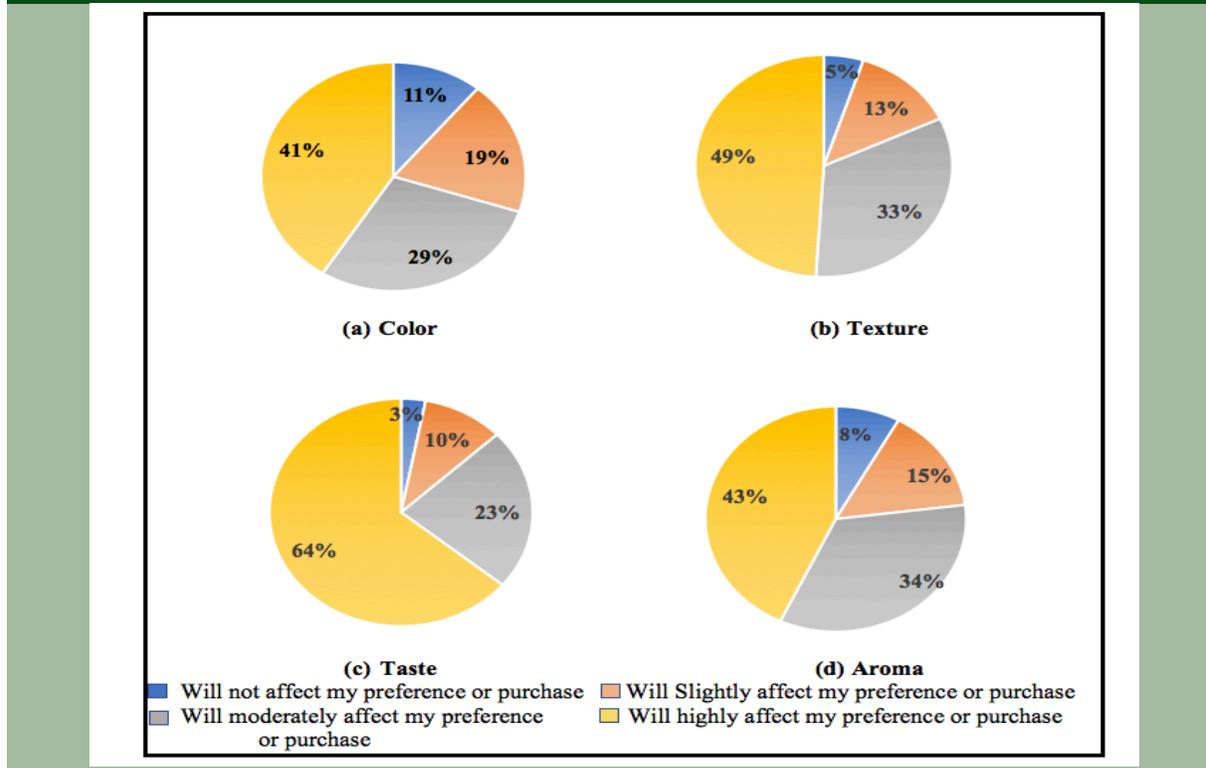
Aroma. Flavor and aroma are inseparably tied together, making the ability to detect and distinguish specific aroma and flavor components crucial to sensory analysis. Much of what we call taste is an intricately entwined matrix of flavor, aroma chemicals, and texture or mouthfeel (Anthony, 2007). The data gathered show that most respondents perceived that aroma would highly moderately affect their preference or purchase of soybean-based meat alternatives (Figure 5d).

Moradian and Rosand (2019) conclude that sensory factors of plant-based substitutes should be equivalent to sensory factors of animal products so that consumer behavior can be driven towards plant-based consumption. They further figure that the more alike substitutes are in taste, texture, and function, the easier it would be to change consumer behavior towards plant-based alternatives. Hence, lowering the barriers to plant-based food would make it easier for consumers to adopt these meat alternatives. Accordingly, identical substitution creates a low barrier and easy transition. These researchers



Figure 5

Perceived Effect of Sensory (Product-Specific) Qualities on the Willingness to Purchase Soybean-based Meat Alternatives, 2019-2020, Baguio City and Benguet Province (n=395)



further conclude that to influence consumers to eat more plant-based products, substitutes must be similar or better in taste and texture. However, the same researchers believe that consumers may accept meat substitutes that are not necessarily identical to animal products by enhancing the sensory qualities in general.

Marketing-Related Factors

Price. Price refers to the cost or selling price of the product. The data gathered shows that price would highly affect respondent preference and purchase of soybean-based food products (Figure 6a). Elzerman et al. (2013) reported that the high price of meat substitutes was considered a negative aspect by consumers. However, according to Kardes et al. (2015), price is an alternative attribute to position a product. Most consumers consistently use price as a gauge of quality. The assumption that there is a strong relationship between price and quality leads consumers to infer that high price signals high

quality. Similarly, Jacoby et al. (1971), as cited by Hoyer et al. (2013), indicated that although economic theory suggests that a price decrease will increase the likelihood of purchase, a very low price can make consumers suspect the product's quality. Prasad et al. (2008) also showed that, on average, households are sensitive to price. Their study showed that the household's price response to food purchases is highly correlated with its health consciousness and that the more health-conscious a household is, the less price-sensitive it is. It is worthy to note that in this present study, respondents place value on their health conditions that will highly affect their purchase of soybean-based food products. Likewise, nutritional value and health benefits are the criteria considered by most of the consumer respondents in buying soybean-based meat alternatives when available in the market. This study suggests that marketers focus on non-price promotions and advertising to make the healthy attribute of the products more salient. Furthermore, with this knowledge on price



sensitivity among consumers, reasonable and affordable prices of meat substitutes may warrant purchase among target consumers.

Availability and Accessibility. Availability and accessibility mean ease in obtaining the products. The accessibility of a product is important for most individuals. Easy availability is essential for long-term success (Weinrich, 2019). About half (48%) of the respondents perceived that accessibility of the store location would highly affect their preference or purchase of soybean-based products, while 36% perceived that it would moderately affect their preference and purchase (Figure 6b). The availability of a product in the market is an important consideration among consumers. According to Kotler (2000), place marketing means designing a place to satisfy the needs of its target market.

In Roudsari et al. (2017) study, easy access to resources was mentioned as a leading factor influencing food choices. The participants in their study indicated that time constraints affect

purchasing the desired foods. Food availability is important to them because they usually do not have plenty of time to buy stuff. The participants were concerned about choosing healthy foods, but they have to avoid them due to lack of time. Producers and marketers of soybean-based products should then determine distribution channels that will allow consumers to access these. Consumers place much value on time and convenience.

Location of Soybean-based Meat Alternative. The survey also considered the preferred location of the soybean-based products to purchase when these products are available. Among the respondents, the most convenient place of purchase for soybean-based products are in the wet/fresh market (41%), direct from local entrepreneurs (30%), and supermarket (28%) (Table 6). This result is understandable in our local setting since most consumers purchase their food supplies from the wet market or buy them directly from local entrepreneurs considering that the prices are lower. Others purchase in the supermarkets for convenience.

Figure 6
Perceived Effect of Marketing-Related Factors on Willingness to Purchase Soybean-based Meat Alternatives, 2019-2020, Baguio City and Benguet Province (n=395)

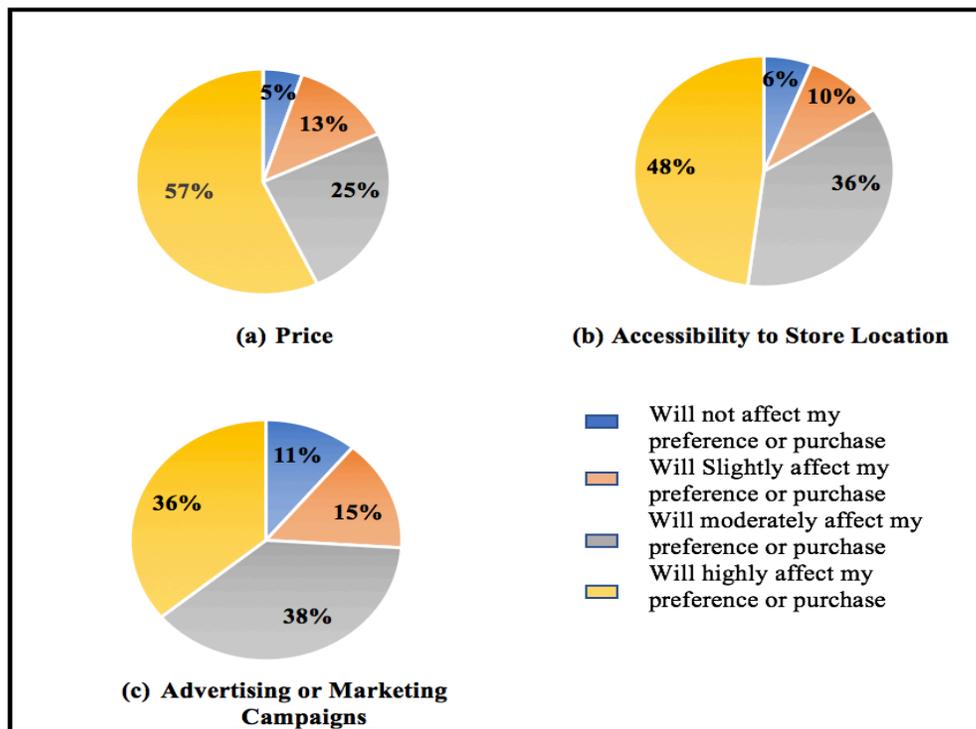


Table 6

Preferred Location of Soybean-based Food Products for Purchase, 2019-2020, Baguio City and Benguet Province (n=395)

Location	Frequency	Percentage
Wet/Fresh Market	162	41%
Supermarket	110	28%
Direct from Local Entrepreneurs	119	30%
Others, pls., specify	4	1%

Advertising. As perceived by the respondents, advertisement/marketing campaign will moderately to highly affect their preference or purchase of soybean-based products (Figure 6c). This result is consistent with Roudsari et al. (2017) findings that media and advertisement contribute to people's familiarity with valid brands and goods. Their participants indicated that foods advertised by the mass media including TV programs and radio are believed to be of good quality, safe, healthy and harmless. The internet is also an important source of health and food-related information, which affected their participants' preferences and purchases of food products.

In the study of Mousel and Tang (2016), they found that two significant barriers that keep people from buying meat replacement products even though they intended to do so are the culture barrier and information barrier. The lack of information on these meat replacement products decreases the likelihood of people buying them. The researchers mentioned that even though these meat analogs appeared in supermarkets, many consumers still do not know what they are made of and if and why they are healthier than animal products. Lea et al. (2006) also found that the main perceived barrier to adopting a plant-based diet was the lack of information about plant-based diets. Hence, information about the products should be readily available, including the ingredients, health, and nutrition benefits in the labels. This available information would make it more likely for consumers to buy these meat alternatives.

Other Factors and Criteria Considered by the Consumer-Respondents

The respondents were asked about other criteria that they will consider in buying soybean-based meat alternatives. Nutritional value (97%), health benefits (68%), affordability (64%), and taste (63%) are important criteria that will make the respondents satisfied with soybean-based food products as meat alternatives (Table 7).

On nutritional value, the respondents were asked if they check nutrition labels to know the nutritional value of the food products when they are buying. Overall, 75% of the respondents check on the nutritional value of the foods they buy. Only 25% rarely or never check on the nutritional value of foods they purchase. This result is a good indication that the consumer-respondents are interested in knowing the nutritional and health benefits of these new products, which may positively influence their purchasing motive. Hoek et al. (2004) showed that health-conscious consumers, specifically vegetarians who paid closer attention to product information labels, were more interested in new products and recipes than meat consumers. Nutrition knowledge of people plays a vital role in identifying and choosing healthy foods. Consumer knowledge about the properties of food, food preparation skills, and health links may influence the food choice process (Roudsari et al., 2017).

Table 7

Criteria that will Satisfy the Consumer-Respondents with Soybean-based Meat Alternatives

Criteria	Frequency	Percentage
Nutritional value	383	97%
Health Benefits	270	68%
Affordability	254	64%
Taste	249	63%

Rimal et al. (2007) showed that consumers with knowledge of links between food and nutrition and health were more likely to consume soyfood



products than those without knowledge. Wansink et al. (2000) showed that soy labels and health claims significantly influenced perceptions and taste. Putting “soy” on a package may negatively influence taste-conscious consumers. Still, when combined with a health claim, it will improve attitudes among health-conscious consumers, natural food lovers, or dieters (Wansink et al., 2000). Providing information on the benefits of meat substitutes or alternatives can influence adoption (Weinrich, 2019). The criteria indicated by the consumer-respondents in this study should then be considered in the product development and marketing of soybean-based food products.

Conclusions

In general, consumers in the locality, regardless of socio-demographic background (sex, age, income, educational attainment, and household size), are willing to buy soybean-based products as meat alternatives when available. Educational level and household size are significantly associated with the intended amount of purchase, while age is significantly associated with the intended frequency of consuming soybean-based food products. Consumer-respondents who are better educated and have smaller household sizes intend to buy more soybean-based products. Older consumer-respondents are expected to consume soybean-based food products as meat alternatives more frequently.

Expectations on product quality, including freshness, quantity per pack, and health condition in terms of individual factors; taste in terms of the product-specific factors; and price in terms of the marketing factors, are the major factors that will highly influence the preference and purchase of soybean-based food products as meat alternatives among consumers in Baguio City and Benguet Province. The secondary factors that will influence the purchase of the products include texture, availability and accessibility, and aroma. Finally, the topmost other criteria that will satisfy potential consumers are nutritional value, health benefits, affordability, and taste of soybean-based food products as meat alternatives.

Recommendations

The high percentage of the consumers' willingness to buy the product shows future possibilities for product development of soybean-based food products as meat alternatives. However, food product developers should consider factors that will highly affect the preference and purchase of the products based on the study findings: on psychological or individual factors, the expectations of consumers on the quality, particularly on the freshness of the product and packing, and meeting the health and nutritional needs of consumers; on sensory or product-specific factors, the taste, texture, and aroma of the soybean-based meat alternatives should be appealing to the consumers; and on marketing or environmental factors, affordable, reasonable price and appropriate quantity per pack, access and availability of the products in the wet market or direct availability from local entrepreneurs, and adequately labeled soybean-based food products to include the nutritional value and health benefits.

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