ISSN: 2347-467X, Vol. 12, No. (1) 2024, Pg. 166-180

Current Research in Nutrition and Food Science

www.foodandnutritionjournal.org

Consumer Preferences for Native Chicken Meat in India: Implications for Sustainable Production and Household Dynamics

G. KATHIRAVAN* and K. CHITRAMBIGAI

Dept. of Animal Husbandry Statistics and Computer Applications, Madras Veterinary College, Tamil Nadu Veterinary and Animal Sciences University, Chennai – 600007, India.

Abstract

Indigenous and native chickens play a pivotal role in rural economies, providing income and food security. India is one of the world's top producers of poultry, with a total chicken population of 851.8 million in 2019 and 37.2% representing native or indigenous breeds. In recent years, the rising demand for native chicken meat and government-backed projects in India have led to a shift from traditional backyard chicken raising to semi-intensive and intensive farms, empowering marginalized communities and women. Consumer preferences for native chicken meat in India was examined in this study, employing a two-part model with a logit model and log-normal OLS model to analyse responses from 503 consumers. Additionally, factor analysis revealed nine key factors influencing attitudes. Gender, age, income, education, marital status, cohabitation, household size, the presence of seniors or children, and consumption frequency significantly shaped preferences. Factors such as psychological well-being, affordability, knowledge, nutrition, food quality, fitness, purity, and sustainability had negative effects on preference and quantity purchased. The study reveals a strong consumer preference for native chicken meat, attributed to its organic nature, including traditional farming and sustainable production. To enhance sustainability of semi-intensive and intensive native chicken farming, it is imperative to address pricing disparities and ensure the consistent availability of native chicken meat. Achieving long-term sustainability in native chicken farming requires aligning consumer demand with ethical and environmentally sustainable farming practices.

Article History

Received: 10 November 2023

Accepted: 03 February 2024

Keywords

Consumer Preferences; Factor Analysis; Household Consumption; Meat Consumption; Native Chicken; Sustainable Farming; Two-Part Model.

CONTACT G. Kathiravan drkathir@tanuvas.org.in Dept. of Animal Husbandry Statistics and Computer Applications, Madras Veterinary College, Tamil Nadu Veterinary and Animal Sciences University, Chennai – 600007, India.

Doi: https://dx.doi.org/10.12944/CRNFSJ.12.1.14

Introduction

Native or indigenous chicken breeds play a pivotal role in rural economies of developing and under developed countries. They are crucial for the rural underprivileged and marginalised groups of the population, not only for providing secondary income but also for supplying eggs and meat for their own sustenance.[1-3] These native chickens or yard fowls are produced worldwide, mostly using backyard and free-range systems with little to no suitable housing.[4] As native birds do not require additional nutritional or management support to produce eggs or meat when individuals supply their kitchen and household kitchen waste as supplementary feed, rural people prefer raising native chickens over high-yielding exotic or hybrid birds.[3,5] Native birds thrive when left to scavenge the owners' backyards without any assistance,[6] ensure rural residents a means of sustaining their way of life and ensuring nutritional security.[7,8]

India is one of the world's top producers of poultry meat and eggs, and the consumption across the country predominantly includes the consumption of chicken meat and eggs. In India, 37.2% of 851.8 million total chickens recorded in 2019 were of the native or indigenous type, and the remaining were improved. In addition, the native/desi poultry population in the country increased by 45.79% in 2019 over 2012, while the commercial poultry population expanded by only 4.5% during this period. Around 50 per cent of the meat produced in India is contributed by poultry (4.06 million tonnes in 2018-19). Because it is affordable and widely available, chicken meat is preferred by the majority of the population as the main meat option. The Indian poultry market is worth $22.97 billion by 2022.[9] Contributions from the chicken meat and egg industries were 75.32 and 24.67%, respectively, and it is projected that the poultry industry market in India will increase at a compound annual growth rate (CAGR) of 10.18% from 2023 to 2028, bringing the total market value to $41.94 billion.[10]

The Indian National Bureau of Animal Genetic Resources characterised and registered 19 chicken breeds in India,[11] and numerous nondescript desi chicken breeds have been reported by many authors.[12-16] Owing to their compatibility with regional taste preferences and cooking methods, native or indigenous chicken breeds are highly desired. Small-scale and backyard poultry farming practices have persisted and grown steadily in regions where large-scale commercially manufactured poultry products are available, which illustrates how local communities have chosen a sustainable production system that results in wholesome, culturally appropriate food.[5,13,17] The demand for native chicken meat has been increasing, and it is priced at premiums over broiler chicken meat. Consumers are prepared to pay more for native chicken meat and eggs, particularly in metropolitan areas. Notably, the retail price of native chicken meat is currently almost three times that of broilers in metropolitan areas.[4]

Although traditionally, native chickens have been reared mostly in backyard environments, semi-intensive and intense native chicken farms have become increasingly common in recent years, which can be attributed to the growing demand for native chicken meat and the lucrative prices it fetches. Additionally, a number of government-sponsored development initiatives in India aggressively promote the raising of native chickens with the aim of improving the livelihoods of women and other marginalised groups. On the demand side, consumers prefer native chickens to broilers assuming that they are produced using a lot more organically. Given these circumstances, this study aimed to investigate the household preferences for native chicken meat that might affect the sustainability of the evolving intensive systems of native chicken production.

Materials and Methods

Consumer preferences for native chicken in India were studied using a structured and pretested online questionnaire. The questionnaire was exclusively administered to individuals residing in India who confirmed their consumption of chicken meat. This Google form survey was conducted through social media from April to May 2023. In this study, a snowball sampling technique was utilized, with researchers and stakeholders serving as social media gatekeepers to promote the survey. Participants were required to meet specific inclusion criteria: residing in India, actively consuming chicken meat, being over 18 years old, and willingly engaging in and completing the online survey. Additionally, participants, regardless of gender, should either primarily or jointly share responsibility for food consumption decisions

within the household, including food shopping and preparation, while also meeting the criterion of being an earning member (for males) or primary shopper (for females, if not earning). In this research study, all survey participants provided informed consent and participated voluntarily. They were provided with clear information about the study's objectives and procedures. Participants were assured that their participation was entirely voluntary, with the right to refrain from submitting the survey form at any time without consequences. Strict ethical guidelines were followed to protect their rights and privacy.

The final dataset included responses from 503 individuals, with 305 expressing a preference for native chicken meat and 198 opting for broiler chicken meat as their choice. Extensive data encompassing demographic and socioeconomic attributes, along with consumers' preferences for consuming native chicken meat and the monthly quantities procured, were collected online. In addition, a set of 39 statements regarding chicken meat purchasing behaviour were presented to survey participants to elucidate their perceptions on a 5-point Likert scale (1, denoting "Strongly Disagree", to 5, representing "Strongly Agree"). The Cronbach's Alpha value of 0.930 for the Likert scale statements demonstrates excellent internal consistency and reliability of the responses.

The statistical and econometric analyses of the data were performed using Stata®16.0. Socioeconomic associations with preferences for native chicken were assessed through chi-square analysis. A Factor Analysis was conducted on the 39 Likert scale statements, employing the Principal Component Analysis Extraction Method and the Varimax Rotation Method with Kaiser Normalisation, which reduced the dimensionality of the statements into nine distinct factors. The factor scores derived from these nine factors were then used as explanatory variables (from X_{19} to X_{27} in Table 1) in the two-part model to study the factors influencing consumers' preferences for native chicken meat.

Table 1: Descriptions of variables in the two-part model (1st Part: Logit; 2nd Part: Log-Normal)

Predictors	Descriptions	Specification	Label
Gender	Male; Female	1 – If Male; 0 – If otherwise	X_1
Age Group (years)	≤ 26; 26–35; 36–45; 46–60; > 60	1 – If ≤ 26; 2 – If 26–35; 3 – If 36–45; 4 – If 46–60; 5 – If > 60	X_2
Monthly Income Brackets (INR)	≤ 10000; 10,001 – 30,000; 30,001 – 60,000; 60,001 – 90,000; > 90,000	1 – If ≤ 10000; 2 – If 10,001 – 30,000; 3 – If 30,001 – 60,000; 4 – If 60,001 – 90,000; 5 – If > 90,000	X_3
Educational levels	Primary School; Secondary School; Collegiate	1 – If Primary; 2 – If Secondary; 3 – If Collegiate	X_4
Marital status	Married; Unmarried (single)	1 – If Married; 0 – If otherwise	X_5
Habitat (living area)	Urban; Rural	1 – If Urban; 0 – If otherwise	X_6
Cohabiting with family	Yes; No	1 – If Yes; 0 – if otherwise	X_7
Senior citizens at home	Yes; No	1 – If Yes; 0 – If otherwise	X_8
Children at home	Yes; No	1 – If Yes; 0 – If otherwise	X_9
Household size	Count	Count	X_{10}
Religiona	Christian; Hindu;	1 – If Hindu; 0 – If otherwise	X_{11}
	Muslim; Others	1 – If Muslim; 0 – If otherwise	X_{12}
		1 – If Others; 0 – If otherwise	X_{13}
Chicken consumption[b] (frequency)	Daily; Alternate Days;	1 – If Daily; 0 – If otherwise	X_{14}
	Twice Weekly; Weekly;	1 – If Alternate Days; 0 –	X_{15}
	Fortnightly; Occasionally	If otherwise	

		1 – If Twice Weekly; 0 – If otherwise	X_{16}
		1 – If Weekly; 0 – If otherwise	X_{17}
		1 – If Fortnightly; 0 – If otherwise	X_{18}
Comfort	Factor Analysis	Factor Score	X_{19}
Affordability	Factor Analysis	Factor Score	X_{20}
Knowledge	Factor Analysis	Factor Score	X_{21}
Nutrition	Factor Analysis	Factor Score	X_{22}
Palatability	Factor Analysis	Factor Score	X_{23}
Food Quality	Factor Analysis	Factor Score	X_{24}
Fitness	Factor Analysis	Factor Score	X_{25}
Purity (natural)	Factor Analysis	Factor Score	X_{26}
Sustainability	Factor Analysis	Factor Score	X_{27}

Reference categories: a – Christian; b – Occasionally (randomly)

In this study, a two-part model, closely related to the 'hurdle model'[18-22] and the Heckman selection model[23] was adopted as a viable alternative to analyze the factors influencing household consumption of native chicken meat with mixed discrete-continuous outcomes.[24]

The structural expression of the two-part model is given by

$$E(Y|X) = Pr(Y>0|X) * E(Y|Y>0, X).$$

The first part Pr(Y>0|X) denotes the probability that a respondent has exhibited preference for native chicken meat given a set of variables X. The second part E(Y|Y>0, X) denotes the expected monthly quantity of native chicken consumed, Y, given that the respondent has nonzero preference Y>0 and a set of variables X. In this study, the first part employed a logit regression to predict the likelihood of a binary event, specifically whether consumers prefer to purchase native chicken (coded as 1) or not (coded as 0), while the second part utilised ordinary least squares (OLS) regression with a log-transformed dependent variable (y) to analyse the quantity associated with the amount of native chicken purchased if a consumer exhibited a preference in the first part. The same set of regressors shown in Table 1 was used in both parts of the model to maintain consistency in the analysis.

Results and Discussion

Preferences for Native Chicken Meat

This study received completed responses from 503 individuals who were chicken meat eaters and tried native chicken meat at least once. Only nine (1.79%) of 503 respondents had never tried broiler chicken meat more than once and restricted the eating of native chicken alone. It should be noted that although 305 of the 503 respondents expressed a preference for native chicken meat, they (except nine strict native chicken meat eaters) ate and purchased broiler chicken meat, which is often larger than native chicken, due to economic and cuisine considerations. They (305) preferred native chicken meat over broiler meat for its taste, nutritional quality, health, organic nature, and elegance when served to guests. In Table 2, the preferences for and consumption of native chicken meat in the study population are described in terms of demographics.

Among the 376 male respondents, 211 (56.12%) indicated that they preferred native chicken meat to broilers, whereas 165 (43.88%) did not. In contrast, among the 127 female respondents, 94 (74.02%) reported an inclination toward native chicken meat, with 33 (25.98%) indicating otherwise. There was also a highly significant (Chi^2=12.74; p=0.000) relationship between gender and preference for native chicken meat, where women showed a considerably higher predisposition for native chicken meat than men.[25] Age segment-based analysis of the tendency to consume native chicken meat revealed a significant association (Chi^2=13.52; p=0.009) between the two groups. In contrast to the younger age groups, older age groups showed a reduced preference for native chicken meat. These results imply that the preferences of the population for native chicken meat are influenced by age.[26] Similarly, a significant association (Chi^2=13.91; p=0.008) was

observed between income levels and preferences for native chicken meat.[27] Accordingly, there was also a significant relationship (Chi²=6.26; p=0.044) between the propensity to consume native chicken meat and the "educational levels" of respondents, with native chicken meat consumption rates of 61.54% for primary educated respondents, 88.89% for secondary-level qualified respondents, and 59.53% for graduates. This shows that consumer consumption patterns and preferences for chicken meat are influenced by educational background.[28]

Table 2: Demography-wise Desi-Chicken Meat Preferences and Consumption

Characteristics	Category	Total (N)	Response Frequency		Quantity (Mean kg.)	Chi² [p value]
			Yes	No		
Gender	Male	376	211 (56.12)	165 (43.88)	1.495	12.74
	Female	127	94 (74.02)	33 (25.98)	1.574	[0.000]
Age Groups	≤ 26 (years)	61	42 (68.85)	19 (31.15)	1.714	13.52 [0.009]
	26–35	103	66 (64.08)	37 (35.92)	1.492	
	36–45	116	78 (67.24)	38 (32.76)	1.538	
	46–60	178	101 (56.74)	77 (43.26)	1.446	
	> 60	45	18 (40.00)	27 (60.00)	1.500	
Income Brackets (INR)	≤ 10000	44	28 (63.64)	16 (36.36)	1.786	13.91
	10,001 – 30,000	75	43 (57.33)	32 (42.67)	1.698	[0.008]
	30,001 – 60,000	96	56 (58.33)	40 (41.67)	1.536	
	60,001 – 90,000	103	78 (75.73)	25 (24.27)	1.378	
	> 90,000	185	100 (54.05)	85 (45.95)	1.470	
Education	Primary	13	8 (61.54)	5 (38.46)	1.750	6.26
	Secondary	18	16 (88.89)	2 (11.11)	1.563	[0.044]
	Collegiate	472	281 (59.53)	191 (40.47)	1.511	
Marital status	Married	412	249 (60.44)	163 (39.56)	1.532	0.04
	Unmarried	91	56 (61.54)	35 (38.46)	1.464	[0.846]
Habitat (living area)	Urban	421	260 (61.76)	161 (38.24)	1.481	1.36
	Rural	82	45 (54.88)	37 (45.12)	1.744	[0.243]
Cohabiting with family?	Yes	437	260 (59.50)	177 (40.50)	1.521	1.81
	No	66	45 (68.18)	21 (31.82)	1.511	[0.178]
Senior citizens at home?	Yes	251	168 (66.93)	83 (33.07)	1.595	8.32
	No	252	137 (54.37)	115 (45.63)	1.427	[0.004]
Children at home?	Yes	251	163 (64.94)	88 (35.06)	1.543	3.89
	No	252	142 (56.35)	110 (43.65)	1.493	[0.049]
Household size (count)	≤ 2	29	11 (37.93)	18 (62.07)	1.500	9.91
	3	117	65 (55.56)	52 (44.44)	1.515	[0.042]

	4	220	139 (63.18)	81 (36.82)	1.435	
	5	77	49 (63.64)	28 (36.36)	1.663	
	≥5	60	41 (68.33)	19 (31.67)	1.646	
Religion	Christian	35	21 (60.00)	14 (40.00)	1.357	5.56
	Hindu	420	261 (62.14)	159 (37.86)	1.506	[0.135]
	Muslim	41	18 (43.90)	23 (56.10)	1.694	
	Others	7	5 (71.43)	2 (28.57)	2.300	
Chicken meat frequency	Daily	34	9 (26.47)	25 (73.53)	1.667	37.01
	Alternate Days	63	34 (53.97)	29 (46.03)	1.471	[0.000]
	Twice Weekly	171	95 (55.56)	76 (44.44)	1.521	
	Weekly	134	94 (70.15)	40 (29.85)	1.441	
	Fortnightly	24	12 (50.00)	12 (50.00)	1.708	
	Occasionally (randomly)	77	61 (79.22)	16 (20.78)	1.607	

Figures in parenthesis indicate per cent to total number of respondents (N)

In contrast, there was no statistically significant association (Chi²=0.04; p=0.846) between respondents' propensity to consume native chicken meat and their marital status. This suggests that native chicken meat consumption patterns were not greatly influenced by marital status.[29] Similarly, the analysis indicated no statistically significant association (Chi²=1.36; p=0.243) between consumer consumption of native chicken meat and habitat (rural or urban). This indicates that habitat (urban or rural) does not play a significant role in determining the predilection for consuming native chicken meat.[30] Likewise, the preference for eating native chicken meat did not have any statistically significant association (Chi²=1.81; p=0.178) with cohabitation (with family) status. This suggests that living arrangements do not significantly affect chicken meat consumption habits in the population.

The preference for eating native chicken meat was significantly associated (Chi²=8.32; p=0.004) with the "living with senior citizens' status of respondents, where 66.93% of those living with the elderly preferred native chicken, while only 54.37% of those who did not live with elderly people preferred. The results showed that the consumption of native chicken meat was higher in households with senior citizens.[26] Similarly, having "children at home" had a significant (Chi²=3.89; p=0.049) association with the preference to eat native chicken meat, with 64.94% of those who had children preferring it and only 56.35% of those who did not. These findings imply that families with children are more likely to prefer buying chicken meat.[31] Likewise, the preference for native chicken meat also had a statistically significant relationship (Chi²=9.91; p=0.042) with respondents' "household size categories". Household size impacts the consumption patterns of chicken meat, with smaller households being less likely to prefer native chicken meat than other categories. In contrast, although Muslims were less likely (43.9%) to prefer native chicken meat, there was no statistically significant relationship (Chi²=5.56; p=0.135) between religion and preference for native chicken meat, with 60.00% of Christians, 62.14% of Hindus, and 71.43% of those who practiced other religions preferring native chicken meat.

Notably, a highly significant association (Chi²=37.01; p=0.000) was found between the frequency of chicken meat consumption and the desire for native chicken meat. Consumers who ate chicken "daily" had a lower preference (26.47%) for native chicken meat, compared to 53.97% of "alternate day" consumers, 55.56% of "twice weekly" consumers, 70.15% of "weekly" consumers, 50.00% of "fort nightly" consumers, and 79.22% of "occasional" consumers. The findings indicated that the preference for native chicken meat is significantly influenced by consumption frequency.[32]

Interrelationships in Customer Attitudes Toward Chicken Meat - Factor Analysis

The results of the factor analysis that illustrate the interrelationships among the attributes of customers' attitudes towards the purchase and consumption of chicken meat are shown in Table 3. The null hypothesis that the population correlation matrix is an identity matrix is rejected by Barlett's test of sphericity, as the chi-square statistic was 14569.540 (p=0.000). The value of the KMO statistic (0.872) was also large (> 0.50), indicating the suitability of the collected data for factor analysis.[33] Furthermore, all the extracted cummunalities were acceptable, and all variables were fit for the factor solution, as their extraction values were large enough. All the first nine components in the initial solution had over one, which accounted for 71.09 per cent of the observed variations. Factor loadings were used to measure the correlation between the variables and the factors. A strong correlation between a variable and the factor is indicated by a loading close to one, and the factors were rotated with the use of varimax with the Keyser normalisation rotation method.[34] Principal component analysis was used for factor extraction, and factors with values greater than 0.300 were considered for interpretation purposes.[35]

Table 3: Results of Factor Analysis (Rotated Factor Loadings)

Statements (about purchase and consumption of chicken meat…)	Component (Factors)								
	1	2	3	4	5	6	7	8	9
Promotes relaxation	.804								
Cheers me up	.788								
Eases stress handling	.761								
Facilitates coping with life's challenges	.756								
Maintains alertness	.738								
Enhances well-being (feel good)	.665								
Cost-effective		.890							
Aware of meat prices		.885							
Always hunt for special deals		.869							
Budget-friendly		.867							
Excellent value for money		.584							
Familiar with chicken meat			.813						
Mindful of my chicken choices			.810						
Conscious of my dietary preferences			.788						
Distinguish chicken products			.785						
Have confidence in my meat choice			.716						
Nutrient-rich				.802					
Promotes good health				.763					
Rich in protein				.723					
Abundant in vitamins and minerals				.673					
Beneficial for skin, teeth, hair, nails, etc.				.632					
Has appealing appearance					.789				
Has pleasant aroma (smell)					.771				
Has delicious taste					.743				
Has enjoyable texture					.733				
Food quality is my key factor						.828			
Food quality guides my purchases						.784			
There are multiple aspects to food quality						.776			
Food quality serves as my motivator						.657			
Helps me control my weight							.836		

Is low in fat	.821			
Is low in calorie	.813			
Free from artificial ingredients		.798		
Additive-free		.796		
Comprises natural ingredients		.763		
I prefer purchasing organic chicken				.791
I prefer to buy free-range chicken				.706
Sustainability is important to me				.657
I support the local farming community				.533

Extraction Method: Principal Component Analysis; Rotation Method: Varimax with Kaiser Normalisation.

Factors: 1 - Psychological Well-Being; 2 - Affordability; 3 - Knowledge; 4 - Nutrition; 5- Palatability; 6 - Food Quality; 7 - Fitness; 8 - Purity (natural); 9 - Traditional farming

Six assertions, viz., 'Promotes relaxation', 'Cheers me up', 'Eases stress handling', 'Facilitates coping with life's challenges', 'Maintains alertness', and 'Enhances well-being (feel good)', are grouped as one factor that is related to the "Psychological Well-Being" of consumers. The advantages of eating chicken meat on an emotional and psychological level are represented by this component as a source of comfort and relaxation.[36,37] By grouping the responses to the five statements, namely, (i) cost-effective, (ii) aware of meat prices, (iii) always hunt for deals, (iv) budget-friendly, and (v) excellent value for money, the factor analysis extracted the second component that can be referred to as "Affordability". The outcomes showed that customers thought about how affordable and cost-effective chicken meat was.[38-40]

The factor analysis derived the third component by clustering the consumers' responses to "familiar with chicken meat", "mindful of my chicken choices", "conscious of my dietary preferences", "distinguish chicken products" and "have confidence in my meat choice" which could be referred to as "knowledge" because it symbolises consumers' knowledge, awareness, and consciousness regarding various aspects of chicken meat.[41-44] "Nutrition," which included the statements "nutrient-rich," "promotes good health," "rich in protein," "abundant in vitamins and minerals," and "beneficial for skin, teeth, hair, nails, etc." was derived as the fourth factor. This factor underscores the perception of consumers that chicken meat is a source of nutrition and health benefits.[37,45,46]

In the factor analysis, the fifth component, "palatability," was created by combining the statements "appealing appearance," "pleasant aroma (smell)," "delicious taste," and "enjoyable texture." This variable reflects how consumers rate the sensory qualities of chicken meat.[45,47-50] "Food Quality" was derived as the sixth component by the factor analysis. This factor was extracted by grouping the responses for "food quality is my key factor", "food quality guides my purchases", "there are multiple aspects to food quality", and "food quality serves as my motivator".[51-53] This component highlights the importance of food quality in individuals' decision making while buying chicken meat. By integrating consumer responses to the assertions that "helps me control my weight," "is low in fat," and "is low in calories," the seventh factor, "Fitness," was derived by factor analysis.[54-56] This factor demonstrates the connection between eating chicken meat and staying physically fit.

The eighth factor, "Purity (Natural)", was extracted through factor analysis by combining the consumers' responses for the statements "free from artificial ingredients", "additive-free", and "comprises natural ingredients".[37] This component exhibits the link between chicken meat choices and the purity or naturalness of chicken meat. With the statements "prefer purchasing organic chicken," "prefer to buy free-range chicken," "sustainability is important to me," and "support the local farming community," the factor analysis extracted the last component, "Sustainability," which reflects consumers' commitment to ethical and sustainable

choices in chicken meat purchases.[57-59] Those who liked organic and free-range chickens and supported local farming communities scored higher on this factor.

Factors Influencing Native Chicken Meat Preferences and Purchases: Two-Part Modelling

A two-part econometric model involving logit regression in part-1 and log-normal OLS in part-2 was used to analyse the factors affecting customers' preferences for native chicken meat and the quantity of their monthly purchases. The robustness of the logit model in describing preference dynamics was proven by the LR chi^2 statistic (332.52). The model's good fit was highlighted by the log likelihood (-170.924), and its efficiency in capturing a sizable portion of variation was shown by the pseudo R^2 (0.493). The significant F-statistic of 5.40 in Part-2 exhibited model fitness. These results indicated that the models used in part-1 and part-2 are valid and adequate.

The results from Table 4 for the two-part model showed the significance of gender in the first part (Logit), which indicated that males were 59.4% less likely to prefer native chicken meat than females. However, it did not significantly influence the quantity purchased in the second part. Therefore, while there may be gender-based preferences due to tastes and dietary preferences, they do not significantly affect consumption quantity.[60]

Table 4: Results of the Two-Part Model (First Part: Logit; Second Part: Log-Normal)

Explanatory Variables	Part 1: LOGIT				Part 2: LOG-NORMAL REG.		
	Coefficient	Exp(B)	z	P > z	Coefficient	z	P > z
X_1	-0.901 (0.380)	0.406	2.37	0.018	0.026 (0.057)	0.45	0.650
X_2	-0.714 (0.193)	0.490	3.70	0.000	-0.066 (0.032)	2.04	0.041
X_3	0.490 (0.138)	1.632	3.54	0.000	0.010 (0.024)	0.44	0.657
X_4	-1.701 (0.450)	0.183	3.78	0.000	-0.137 (0.069)	2.00	0.046
X_5	2.505 (0.665)	12.247	3.77	0.000	0.325 (0.094)	3.47	0.001
X_6	0.377 (0.385)	1.458	0.98	0.327	-0.214 (0.071)	3.02	0.002
X_7	-2.145 (0.581)	0.117	3.69	0.000	-0.033 (0.074)	0.44	0.660
X_8	0.751 (0.317)	2.119	2.37	0.018	0.094 (0.053)	1.78	0.075
X_9	0.329 (0.331)	1.389	0.99	0.321	0.014 (0.056)	0.25	0.803
X_{10}	0.351 (0.144)	1.421	2.45	0.014	0.045 (0.024)	1.93	0.054
X_{11}	-0.350 (0.555)	0.704	0.63	0.528	0.107 (0.101)	1.06	0.288
X_{12}	-2.383 (0.774)	0.092	3.08	0.002	0.008 (0.146)	0.06	0.954
X_{13}	0.524 (1.177)	1.688	0.44	0.656	0.750 (0.213)	3.53	0.000
X_{14}	-3.427 (0.770)	0.032	4.45	0.000	0.165 (0.155)	1.07	0.286
X_{15}	-1.759 (0.638)	0.172	2.76	0.006	0.035 (0.098)	0.36	0.717
X_{16}	-2.266 (0.555)	0.104	4.08	0.000	-0.036 (0.073)	0.50	0.617
X_{17}	-1.369 (0.567)	0.254	2.41	0.016	-0.089 (0.071)	1.25	0.211
X_{18}	-2.414 (0.759)	0.089	3.18	0.001	0.052 (0.131)	0.40	0.693
X_{19}	-0.672 (0.153)	0.511	4.38	0.000	-0.095 (0.023)	4.19	0.000
X_{20}	0.785 (0.161)	0.456	4.88	0.000	-0.092 (0.022)	4.14	0.000
X_{21}	-0.417 (0.151)	0.659	2.75	0.006	-0.044 (0.023)	1.94	0.052
X_{22}	-0.841 (0.170)	0.431	4.96	0.000	-0.072 (0.023)	3.20	0.001
X_{23}	-0.241 (0.164)	0.786	1.47	0.143	-0.013 (0.024)	0.54	0.591
X_{24}	-0.552 (0.138)	0.576	4.00	0.000	-0.064 (0.022)	2.89	0.004
X_{25}	-1.563 (0.188)	0.209	8.31	0.000	-0.169 (0.025)	6.69	0.000
X_{26}	-0.673 (0.149)	0.510	4.51	0.000	-0.098 (0.023)	4.18	0.000
X_{27}	1.166 (0.166)	3.209	7.01	0.000	0.136 (0.027)	5.13	0.000
Constant	6.693 (1.819)	806.385	3.68	0.000	0.322 (0.240)	1.34	0.180

N	= 503	N = 305	
LR $chi^2(27)$	= 332.52	F (27, 277)	= 5.40
Prob > chi^2	= 0.000	Prob > F	= 0.000
Log likelihood	= -170.924	R^2	= 0.345
Pseudo R^2	= 0.493	Adj. R^2	= 0.281
		Log likelihood	= -140.313
		Root MSE	= 0.4022
		Log pseudolikelihood	= -311.23659

Figures in parenthesis indicate Standard Errors

As people aged a stage, both their preferences for and purchases of local chicken significantly reduced, by 51.0% in the first part and by 6.39% in the second part. This trend may be due to growing health concerns' impact on dietary preferences.[61] While income was not found to have a significant effect on the amount of native chicken meat purchased in Part-2, the results in Part-1 indicated that when income is raised by a category, consumers are 1.632 times (or 63.2%) more likely to choose native chicken. The findings support economic theories of consumer behaviour [62] by showing that higher-income individuals had a larger range of food choices, including for specialty foods such as native chicken. As the levels of education rise, preferences for native chicken decline significantly by 81.70% in the first part and quantity purchases by 12.80% in the second. These results are consistent with studies showing that higher education is associated with more exposure to a broad range of foods and dietary alternatives.[63]

Marital status had a significant impact on both consumers' preferences for native chicken (first-part) and the quantity purchased (second-part). Married consumers preferred native chicken meat 12.247 times more than unmarried consumers and purchased 38.40% more, possibly influenced by larger family sizes or shared dietary preferences. Consumer preferences for native chicken meat (first-part) were not significantly influenced by their habitat (urban or urban) of living. However, in the second part, it was found that urban consumers purchased in a quantity that was 19.27% lower than that of their counterparts, which might be because rural consumers had more convenient access to native chicken meat at all times.

The consumers having senior citizens at home had a significant odd of preferring native chicken by 2.119 times (part-1), whereas their presence did not significantly impact the quantity of native chicken purchased (pat-2). The results implied that older people could prefer traditional native chicken meat over quantity because they would consume it in relatively smaller quantities.[64] However, neither the customers' preference for (part-1) nor the quantity of (part-2) native chicken meat they purchased were significantly influenced by having kids at home. This insignificance may be related to the children's choice for meals made primarily using broiler meat either at home or away. In part-1, a significant coefficient for household size indicates that there is a 42.10% greater likelihood of preferring native chicken for every additional unit in household size. In part 2, the household size coefficient is 0.045 (p=0.054), which is barely significant. These findings suggest that larger households may have more varied eating habits and a propensity for traditional foods such as native chicken.

Hindu and other religious consumers did not show a significant preference for native chicken in the first part, which used Christianity as the reference group. Only Muslims, nevertheless, demonstrated a significantly lower preference, with a likelihood that was reduced by 90.80%, perhaps as a result of dietary limitations on certain meats. However, in part 2, only the consumers of other religions purchased significantly more (68.80%) than Christians, while Hindus and Muslims exhibited no significant difference in their quantities purchased. These results support the hypothesis that various religious and cultural groups may have unique dietary preferences and consumption patterns.[63]

Notably, part-1 of the analysis revealed that respondents who consumed chicken daily, every other day, twice weekly, once weekly, or every two weeks had significantly lower preferences for

native chicken meat than occasional or random chicken meat consumers (used as a reference); however, part-2 of the analysis revealed that these consumption frequencies had no significant impact on the quantity of native chicken purchased. As a result of increased native chicken meat prices, regular chicken consumers may have to spend more to satisfy their desire for native chicken; however, they might eat more broiler meat with the same budget.

With the exception of "Palatability," eight of the nine factor scores from factor analysis that were included as predictors in the two-part model had a significant negative impact on both part-1 (preference) and part-2 (quantity purchased). These eight significant factors, namely, (i) psychological well-being, (ii) affordability, (iii) knowledge, (iv) nutrition, (v) food quality, (vi) fitness, (vii) purity (natural), and (viii) sustainability, demonstrated a consistent and statistically significant negative impact on both preference for and quantity purchase of native chicken meat. Palatability may not have had a significant impact on native chicken meat preference and quantity purchase in the context of the analysis because it is universally desired, but the other eight factors may have had a different impact due to their unique characteristics and personal preferences.

The excessively high pricing (68%), the challenge in finding the precise quantities desired (23%), and just 9% dislike of the taste were the main justifications given by respondents who did not purchase native chicken meat. Even among those who preferred and purchased native chicken meat, their purchasing power was still significantly constrained by its greater price and difficulty in being found in the precise quantities they needed. On average, Native chicken meat typically costs approximately 75% more than broiler meat. People had to purchase complete chicken because native chicken meat, unlike broiler meat, was not available in portions. This means that for a family of two to three, the quantity from one bird will be greater, whereas for larger homes, it will either be insufficient and require the purchase of multiple birds.

With their economies of scale, the expanding semi-intensive and intensive systems of native chicken production have the potential to significantly increase market supply and thus address the issues of rising market pricing and limited availability of desired quantities, eventually contributing to the sustainability of the evolving native chicken production systems.

Conclusions

Preference for and consumption of native chicken meat in India were investigated using a two-part model and factor analysis. Consumer preferences have been found to be significantly influenced by demographic parameters, such as gender, age, income, education, marital status, cohabitation, household size, presence of senior citizens or children within households, and consumption frequency. Additionally, factors such as psychological well-being, affordability, knowledge, nutrition, food quality, fitness, purity (natural), and sustainability have a negative influence on both preferences and quantity of native chicken meat purchased.

An important problem in the market for native chicken meat is the price difference, which is approximately 75% higher for native chicken meat than for broiler meat. Additionally, consumers had to purchase the entire chicken because native chicken meat was not readily available in the required quantities. This brought on challenges for smaller households and may have resulted in under- or overconsumption for larger families. The results of this study indicated a significant preference for native chicken meat, which is driven by the sustainability advantages of this food, such as ethical and sustainable production. However, improving the sustainability of semi-intensive and intensive native chicken farming depends on eliminating pricing disparities and ensuring the availability of native chicken meat in desired quantities. The long-term sustainability of native chicken farming relies on integrating consumer demand with ethical and environmentally sustainable farming methods.

Funding

The authors did not receive financial support from any organization for the submitted work.

Conflict of Interest

The authors declare no conflict of interests associated with the research, including financial, personal, or professional affiliations that could influence or be perceived to influence the work presented in this manuscript.

Authors Contributions

G.K. and K.C. conceived of the presented idea. G.K. developed the theory and performed the computations. K.C. verified the analytical methods. Both G.K. and K.C. discussed the results and contributed to the final manuscript. All authors read and approved the final manuscript.

Data Availability Statement

The datasets generated and analysed during the current study are available from the corresponding author on reasonable request.

Informed Consent Statement

In this research study, all survey participants provided informed consent and participated voluntarily. They were provided with clear information about the study's objectives and procedures. Participants were assured that their participation was entirely voluntary, with the right to refrain from submitting the survey form at any time without consequences. Strict ethical guidelines were followed to protect their rights and privacy.

References

1. Ahlers C, Alders R, Bagnol B, *et al*. Improving Village Chicken Production: A Manual for Field Workers and Trainers. MN139. Canberra: *Australian Centre for International Agricultural Research* (ACIAR); 2009. https://www.aciar.gov.au/sites/default/files/legacy/node/11129/mn139_improving_village_chicken_production_a_manu_59315.pdf Accessed October 10, 2023
2. Turk JM. Poverty, livestock and food security in developing countries. *CABI Rev*. 2013; 8(033): 1-8. doi:10.1079/PAVSNNR20138033
3. Padhi MK. Importance of Indigenous Breeds of Chicken for Rural Economy and Their Improvements for Higher Production Performance. *Scientifica* (Cairo). 2016; Article ID 2604685: 1-9. https://doi.org/10.1155/2016/2604685
4. Haunshi S, Rajkumar U. Native chicken production in India: present status and challenges. *Livest Res Rural Dev.* 2020; 32(11): 181. http://www.lrrd.org/lrrd32/11/ullen32181.html Accessed October 10, 2023
5. Wong JT, de Bruyn J, Bagnol B, *et al*. Small-scale poultry and food security in resource-poor settings: A review. *Glob Food Sec.* 2017; 15: 43-52. https://doi.org/10.1016/j.gfs.2017.04.003
6. Sonaiya EB. Direct assessment of nutrient resources in free-range and scavenging systems. *Worlds Poult Sci J.* 2004; 60(4): 523-535. https://doi.org/10.1079/WPS200435
7. Aklilu HA, Udo HMJ, Almekinders CJM, Van der Zijpp AJ. How resource poor households value and access poultry: Village poultry keeping in Tigray, Ethiopia. *Agric Syst.* 2008; 96(1-3): 175-183. https://doi.org/10.1016/j.agsy.2007.07.008
8. Azzarri C, Zezza A, Haile B, Cross E. Does Livestock Ownership Affect Animal Source Foods Consumption and Child Nutritional Status? Evidence from Rural Uganda. *J Dev Stud.* 2015; 51(8): 1034-1059. https://doi.org/10.1080/00220388.2015.1018905
9. DAHD. Annual Report 2022-23. Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India; 2023.
10. IMARC-2023. India Poultry Market Report, Report ID: SR112023A1042. https://www.imarcgroup.com/indian-poultry-market/ Accessed October 10, 2023
11. Kanakachari M, Rahman H, Chatterjee RN, Bhattacharya TK. Signature of Indian native chicken breeds: a perspective. *Worlds Poult Sci J.* 2022; 78(2): 421-445. https://doi.org/10.1080/00439339.2022.2026201
12. Mohapatra SC, Panda B. Poultry genetic resources of India. In: Indian Poultry Industry Yearbook. New Delhi: Rekha Printers Pvt. Ltd.; 1991: 50-58.
13. Aini I. Indigenous chicken production in south-east asia. *Worlds Poult Sci J.* 1990; 46(1): 51-57. https://doi.org/10.1079/WPS19900010
14. Fumihito A, Miyake T, Sumi S, Takada M, Ohno S, Kondo N. One subspecies of the red junglefowl (Gallus gallus gallus) suffices as the matriarchic ancestor of all

domestic breeds. *Proc Natl Acad Sci*. 1994; 91(26): 12505-12509. https://doi.org/10.1073/pnas.91.26.12505

15. Iqbal S, Pampori ZA. Production potential and qualitative traits of indigenous chicken of Kashmir. *Livest Res Rural Dev.* 2008; 20(11): 182. http://www.lrrd.org/lrrd20/11/iqba20182.htm Accessed October 10, 2023
16. Fadhil IA, Dakheel MH, Hussein TH. Detection of genetic diversity through two poultry breeds by using RAPD-PCR Technique. *J Babylon Univ Appl Sci.* 2016; 9(24): 2661-2668.
17. Suganthi RU. The uniqueness of immunocompetence and meat quality of native chickens: a specialized review. *World J Pharm Pharm Sci.* 2014; 3: 2576-2588.
18. Duan N, Manning WG, Morris CN, Newhouse JP. Choosing between the Sample-Selection Model and the Multi-Part Model. *J Bus Econ Stat.* 1984; 2(3): 283. https://doi.org/10.2307/1391711
19. Jones AM. A double-hurdle model of cigarette consumption. *J Appl Econom.* 1989; 4(1): 23-39. https://doi.org/10.1002/jae.3950040103
20. Hilbe J, Hardin J. HPLOGIT: Stata module to estimate Poisson-logit hurdle regression. Stat Software Components. S456405, Boston College Department of Economics. http://fmwww.bc.edu/repec/bocode/h/hplogit.ado Accessed October 1, 2023
21. Kathiravan G, Thirunavukkarasu M, Arumugam R, Manivannan C. Demand for public vs. private livestock services in South India: a double hurdle analysis. *Indian J Sci Technol.* 2009; 2(2): 55-62. https://dx.doi.org/10.17485/ijst/2009/v2i2.14
22. Colin CA, Pravin T. Regression Analysis of Count Data, Second Edition. Cambridge University Press; 2013. https://doi.org/10.1017/CBO9781139013567
23. Heckman JJ. Sample Selection Bias as a Specification Error. *Econometrica*. 1979;47(1):153. https://doi.org/10.2307/1912352
24. Kathiravan G, Thirunavukkarasu M, Selvam S. Are farmers willing to pay for quality improvements in livestock services delivery? Evidence from South India? *Indian J Anim Sci.* 2012; 82 (6): 634–639. https://epubs.icar.org.in/index.php/IJAnS/article/view/19031/9382
25. Alam M, Ohid Ullah M, Umme Fahmida Malik S, Shahidul Islam M. Broiler and Indigenous Chickens: A Comparison through Biochemical Parameters. *Int J Sustain Agric Res.* 2020;7(4):228-233. https://doi.org/10.18488/journal.70.2020.74.228.233
26. Setyawati AK, Marwanti S, Sundari MT. Factors affecting the demand for native chicken eggs in Surakarta City. In: IOP Conference Series: *Earth and Environmental Science.* 2021; 905: 012050. https://iopscience.iop.org/article/10.1088/1755-1315/905/1/012050
27. Monisha K, Moghana Lavanya S, Mahendran K, Vasanthi R. A study on consumer preference towards purchase and consumption of free-range country chicken meat in Erode district. *Pharma Innov J*. 2021; SP-10(11): 2722-2726.
28. Nkegbe EK, Assuming-Bediako N, Aikins-Wilson S, Hagan A. Meat Consumption Trends in Some Selected Households in Accra Ghana. *Asian J Agri and Food Sci.* 2013; 1(4): 151-157. https://ajouronline.com/index.php/AJAFS/article/view/443/277
29. Higenyi J. Social and Quality Attributes Influencing Consumption of Native Poultry in Eastern Uganda. *Anim Vet Sci.* 2014; 2(2): 42-48. https://doi.org/10.11648/j.avs.20140202.15
30. Bett HK, Musyoka MP, Peters KJ, Bokelmann W. Demand for Meat in the Rural and Urban Areas of Kenya: A Focus on the Indigenous Chicken. *Econ Res Int.* 2012; Article ID 401472: 1-10. https://doi.org/10.1155/2012/401472
31. Pym R, Bleich EG, Hoffmann I. The relative contribution of indigenous chicken breeds to poultry meat and egg production and consumption in the developing countries of Africa and Asia. In: Romboli I, Flock D, Franchini A. Proc XII Eur Poult Conf. Italy: *World's Poultry Science Assoc.* 2006. https://www.cabi.org/Uploads/animal-science/worlds-poultry-science-association/WPSA-italy-2006/10222.pdf Accessed October 10, 2023
32. Lee MA, Jung Y, Jo C, Park JY, Nam KC. Analysis of consumers' preferences and price sensitivity to native chickens. *Korean J Food Sci Anim Resour.* 2017; 37(3): 469-476. https://doi.org/10.5851/kosfa.2017.37.3.469
33. Kaiser HF. A second generation little jiffy. *Psychometrika*. 1970; 35(4): 401-415. https://

psycnet.apa.org/doi/10.1007/BF02291817
34. De Roover K, Timmerman ME, Ceulemans E. How to detect which variables are causing differences in component structure among different groups. *Behav Res Methods*. 2017; 49(1): 216-229. https://doi.org/10.3758/s13428-015-0687-8
35. Jolliffe IT, Cadima J. Principal component analysis: a review and recent developments. *Philos Trans R Soc A Math Phys Eng Sci.* 2016; 374(2065): 20150202 https://doi.org/10.1098%2Frsta.2015.0202
36. Uzmay A, Yercan M, Doğan ZA. Factors affecting consumer preferences for chicken meat in Izmir metropolitan city. In: Proc 24th *Int Sci Agric Food Ind Sarajev Bosnia Herzegovina,* 25-28 Sept 2013: 121-124
37. Asante-Addo C. Analysis of Consumer Attitudes, Preferences, and Demand for Poultry Meat in Ghana. [Doctoral dissertation]; Goettingen: Georg-August-University Goettingen, Germany. 2020. https://literatur.thuenen.de/digbib_extern/dn063287.pdf Accessed October 10, 2023
38. Mäkiniemi JP, Vainio A. Barriers to climate-friendly food choices among young adults in Finland. *Appetite.* 2014; 74. https://doi.org/10.1016/j.appet.2013.11.016
39. Ares G, Machín L, Girona A, Curutchet MR, Giménez A. Comparison of motives underlying food choice and barriers to healthy eating among low medium income consumers in Uruguay. *Cad Saude Publica*. 2017; 33(4): e00213315 https://doi.org/10.1590/0102-311x00213315
40. Ali BJ. Consumer attitudes towards healthy and organic food in the Kurdistan region of Iraq. *Manag Sci Lett.* 2021; 11(7): 2127-2134. https://doi.org/10.5267/j.msl.2021.2.015
41. Sanchez-Sabate R, Sabaté J. Consumer attitudes towards environmental concerns of meat consumption: A systematic review. *Int J Environ Res Public Health.* 2019; 16(7): 1220. https://doi.org/10.3390/ijerph16071220
42. Mtolo M, Ikusika OO, Mpendulo TC, Haruzivi C. Consumers' perception of poultry meat from insect-fed chickens: University students focus study. *Cogent Food Agric.* 2022; 8(1): 2140471. https://doi.org/10.1080/23311932.2022.2140471
43. Meeprom S, Jaratmetakul P, Boonkum W. Examining the effect of consumer experience on co-creation and loyalty for healthy meat consumption. *Front Sustain Food Syst.* 2023; 7: 1123984. https://doi.org/10.3389/fsufs.2023.1123984
44. Scudiero L, Tak M, Alarcón P, Shankar B. Understanding household and food system determinants of chicken and egg consumption in India. *Food Secur.* 2023; 15(5): 1231–1254. https://doi.org/10.1007/s12571-023-01375-3
45. Neima HA, Sirwan K, Hameed K. Consumers Choice and Preference for Chicken Meat in Sulaymaniyah. In: IOP Conference Series: *Earth and Environmental Science*. 2021; 910: 012028. https://doi.org/10.1088/1755-1315/910/1/012028
46. Valli C, Maraj M, Prokop-Dorner A, *et al*. People's Values and Preferences about Meat Consumption in View of the Potential Environmental Impacts of Meat: A Mixed-methods Systematic Review. *Int J Environ Res Public Health.* 2023; 20: 286. https://doi.org/10.3390/ijerph20010286
47. Sow TMA, Grongnet JF. Sensory characteristics and consumer preference for chicken meat in Guinea. *Poult Sci.* 2010; 89(10): 2281-92. https://doi.org/10.3382/ps.2010-00679
48. Font-i-Furnols M, Guerrero L. Consumer preference, behavior and perception about meat and meat products: An overview. *Meat Sci.* 2014; 98(3): 361-371. https://doi.org/10.1016/j.meatsci.2014.06.025
49. Mir NA, Rafiq A, Kumar F, Singh V, Shukla V. Determinants of broiler chicken meat quality and factors affecting them: a review. *J Food Sci Technol.* 2017; 54(10): 2997-3009. https://doi.org/10.1007/s13197-017-2789-z
50. Damaziak K, Stelmasiak A, Riedel J, *et al*. Sensory evaluation of poultry meat: A comparative survey of results from normal sighted and blind people. *PLoS One.* 2019; 14(1): e0210722. https://doi.org/10.1371%2Fjournal.pone.0210722
51. Vukasovič T. Buying decision-making process for poultry meat. *Br Food J.* 2010; 112(2): 125-139. https://doi.org/10.1108/00070701011018815
52. Collier ES, Oberrauter LM, Normann A, *et al*. Identifying barriers to decreasing meat

consumption and increasing acceptance of meat substitutes among Swedish consumers. *Appetite.* 2021; 167:105643. https://doi.org/10.1016/j.appet.2021.105643

53. Grzybowska-Brzezińska M, Banach JK, Grzywińska-Rąpca M. Shaping Poultry Meat Quality Attributes in the Context of Consumer Expectations and Preferences-A Case Study of Poland. *Foods* (Basel, Switzerland). 2023; 12(14): 2694. https://doi.org/10.3390/foods12142694
54. Kubberød E, Ueland Ø, Tronstad Å, Risvik E. Attitudes towards meat and meat-eating among adolescents in Norway: A qualitative study. *Appetite.* 2002; 38(1):53-62. https://doi.org/10.1006/appe.2002.0458
55. Melanson K, Gootman J, Myrdal A, Kline G, Rippe JM. Weight loss and total lipid profile changes in overweight women consuming beef or chicken as the primary protein source. *Nutrition.* 2003; 19(5): 409-414. https://doi.org/10.1016/s0899-9007(02)01080-8
56. Marangoni F, Corsello G, Cricelli C, *et al*. Role of poultry meat in a balanced diet aimed at maintaining health and wellbeing: an Italian consensus document. *Food Nutr Res*. 2015; 59(1): 27606. https://doi.org/10.3402/fnr.v59.27606
57. Busse M, Kernecker ML, Zscheischler J, Zoll F, Siebert R. Ethical Concerns in Poultry Production: A German Consumer Survey About Dual Purpose Chickens. *J Agric Environ Ethics*. 2019; 31: 105748. https://doi.org/10.1007/s10806-019-09806-y
58. Kaygisiz F, Bolat BA, Bulut D. Determining factors affecting consumer's decision to purchase organic chicken meat. *Rev Bras Cienc Avic*. 2019; 21(4). https://doi.org/10.1590/1806-9061-2019-1060
59. Garcez de Oliveira Padilha L, Malek L, Umberger WJ. Sustainable meat: Looking through the eyes of australian consumers. *Sustain.* 2021; 13(10): 5398. https://doi.org/10.3390/su13105398
60. Grogan S, Richards H. Body Image: Focus Groups with Boys and Men. *Men Masc*. 2002; 4(3): 219-232. https://psycnet.apa.org/doi/10.1177/1097184X02004003001
61. Sobal J, Bisogni CA. Constructing Food Choice Decisions. *Ann Behav Med.* 2009; 38(S1): 37-46. https://doi.org/10.1007/s12160-009-9124-5
62. Deaton A, Muellbauer J. An Almost Ideal Demand System. *Am Econ Rev.* 1980; 70(3): 312-326.
63. Beydoun MA, Powell LM, Wang Y. The association of fast food, fruit and vegetable prices with dietary intakes among US adults: Is there modification by family income? *Soc Sci Med.* 2008; 66(11): 2218-2229. https://doi.org/10.1016%2Fj.socscimed.2008.01.018
64. Beardsworth A, Keil T. The Vegetarian Option: Varieties, Conversions, Motives and Careers. *Sociol Rev*. 1992; 40(2): 253-293. https://doi.org/10.1111/j.1467-954X.1992.tb00889.x