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Consumer's Perspectives on Misinformation Links with the Consumption of Broiler Meat: A Case of Kandy District - Sri Lanka[#]

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ABSTRACT

The study described herein aimed to investigate the relationship between perceptions of hormone usage and customer preferences for broiler meat and meat products in Sri Lanka with special reference to Kandy district. A total of 460 respondents from Kandy district were interviewed using a pre-tested questionnaire. The analysis revealed that 85.9% of the respondents believes the fact that the hormones are used in broiler production. Also, 75.7% of the respondents were unaware about the fact that the hormones are totally banned from Sri Lankan broiler production. Around 71.4% believed that the hormones are still being used illegally in broiler production in Sri Lanka. The study also found that the general public (36.2%), was the main source that the respondents perceived this false information concerning hormone use. Similarly, 83.7% believes that these chemical substances create health hazards to human. 76.7% of the respondents strongly believed the fact that the adolescent girls who consume broiler meat regularly during their childhood may experience early puberty. The findings of the present study concluded that three misconceptions of (i) use of hormones to attain high growth rates in broilers (ii) hormones assumed to be present in broiler meat pose health hazards to public and (iii) frequent broiler meat consumption during childhood is accompanying with the early puberty in adolescent girls, do exists. Though the majority of the sample comprises of highly educated professionals, these misinformation were spreaded from the information generated among the general public. However stipulating a valid certification with no added hormone in broiler chicken meat will be helpful in changing the mind-set of general public.

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Introduction

Broiler meat is one of the most crucial animal originated protein sources which can contribute to nutritious, healthy and balanced diets at an affordable price (Fiala, 2008). As a consequence, the global broiler chicken production has skyrocketed to meet both the global demand and the financial gain (Najeeb et al., 2014). Broiler chickens (*Gallus domesticus*) are bread primarily for their meat and are popular due to their faster growth rate, minimal fat cover, tender and delicate flesh (Haque et al., 2020). Moreover, the current broiler sector has a competitive advantage of having a better feed conversion efficiency than other food animals, use fewer inputs and expenses and provide a greater output per unit area (Ozturk et al., 2012; Ozturk 2017; FAO 2022). Furthermore, chicken meat is crucial in ensuring a sustainable food supply since it emits fewer greenhouse gases than other protein sources (Caro et al., 2017).

Poultry meat is the most rapidly expanding meat category in Sri Lanka (Prabakaran, 2003). Over the last three decades, poultry industry, remarkably the broiler industry in Sri Lanka, has been progressed from backyard system to a highly commercial industry with the strong and passionate participation of the private sector. Sri Lanka has 12,583 broiler farms and 83,611 poultry enterprises in 2020, where 216.16 (000 MT) of chicken meat and 11,220.40 (MT) of chicken meat-based products were produced (Livestock statistical bulletin, 2020). As revealed, the annual per capita chicken consumption in Sri Lanka is 9.79 kg, whereas the world average is 8.57 kg (Livestock statistical bulletin, 2020).

Before evolving new technologies in the poultry industry, it took around 120 days for a broiler to reach a weight of 1.5 kg; currently, it is accomplished only in 30 days. Thus indisputably, the broilers are characterised by their faster growth over a short period (Jaturasitha et al.,

2017). Furthermore, at the end of 6 to 7 weeks of production period, the modern broiler industry can produce broilers weighing around 2 kg or more (Maurer, 2003). Genetic improvement and improved nutrition have contributed to the large size broilers. Moreover, the general productivity benefited from the pleasant environment and the appropriate management practices have identified as best contributed to the bird's productivity.

However, striking changes that have occurred over the time might make people to concern about the rapid growth rate of broilers. Therefore, the use of hormones in broiler meat production has recently received a notable attention from the sides of consumers, media, and other entities. It has been traced that six hormones had been licensed and approved by the Food and Drug Administration (FDA, 2016) to be used in livestock production. Several hormones such as progesterone, 17-β-oestradiol, testosterone and its anabolic derivatives like zeranol and clenbuterol are commonly used in livestock production to fatten the animals (Hirpessa et al., 2020). Oestradiol, testosterone and progesterone are the natural sex hormones therefore, meat cannot be tested for the presence of these hormone residues since the animals produce them naturally. Zeranol, trenbolone acetate and melengestrol acetate are growth-promoting synthetic hormones and in human, these hormones have been proven to be mutagenic, genotoxic, teratogenic, neurotoxic, and carcinogenic (Gandhi and Snedeker, 2000; Hirpessa et al., 2020). Though hormones assist the feedlot cattle in gaining weight and increasing feed efficiency before slaughtering, regulations do not permit hormone to be used in poultry (ducks, chickens and turkeys) or pork production (USFDA, 2015; Yang et al., 2017). It is noteworthy that international legislation has been enacted restricting the usage of hormones in poultry (Hirpessa et al., 2020). The use of hormones (anabolic steroids such as oestradiol, testosterone, nandrolone, stilbene, estrogen, progestogens etc.) for food animals is banned in Sri Lanka (Gazette No. 1,292, 06.06.2003). Though it has never been utilised in poultry in several countries, in 1970's, the use of hormones in poultry diets was forbidden in some countries (FDA, 2016).

Although consumers may have a different perspectives on the use of hormones in livestock production, misinformation added by the media may mislead the consumers to assume that the meat industry often uses hormones to fatten the animals (Yang et al., 2017). However, social media platforms highlight the false belief that "chickens are given hormones to make more meat" has spreaded worldwide (Esquivel-Hernandez et al., 2016). This misinformation imposed a negative repercussion for the poultry sector whilst establishing false public health concerns such as cancer, obesity and early puberty in adolescent females though there are no added hormones available in commercial broiler chickens (Esquivel-Hernandez et al., 2016). Moreover, faulty food labels also creates doubts and influences the perceptions of the quality of the product (Yang et al., 2020). Consumers can find poultry products those are branded as 'No added hormones' in supermarkets, even though hormones are not used during the production chain. This may lead consumers to believe that hormones are used in poultry production (Yang et al., 2020).

Antibiotics have been a standard part of the broiler diet for decades. Antibiotics were incorporated in broiler diets keeping the prime objective as disease prophylaxis, control and treatment, and as a growth promoter to enhance productivity and feed efficacy (Tollefson and Miller, 2000; Gaskins et al., 2006). However in 2006, the use of antibiotics in poultry diets were banned in many countries (FDA, 2016) while Sri Lanka, Indonesia, Bhutan Bangladesh, Myanmar, Thailand and Nepal imposed antibiotic restriction (Cardinal et al., 2019). However antibiotic residues, antimicrobial resistance, pesticide residues, are of wider concerns in the current broiler industry (Haque et al., 2020).

According to Clark et al. (2017) and del Bosque et al. (2021), purchasing decisions of consumers for broiler meat are influenced by many factors. Price is unquestionably one of the major factors considering when purchasing meat. Nonetheless, understanding purchasing decisions for varied meat products is also more or less driven by perceptions held by consumers. Since consumer beliefs influence consumer decisions, monitoring consumer beliefs is noteworthy for assessments of consumer behaviour (Lusk et al., 2014). Researchers from different countries evaluated the consumer concerns about hormone usage in broiler meat (Gandhi and Snedeker, 2000; Yang et al., 2020). However, only very limited number of systematic studies were carried out in Sri Lanka to evaluate the public's knowledge on hormone-free broiler chickens. Therefore, this work aimed to investigate the relationship between perceptions of hormone usage and customer preferences for broiler meat and meat products in Sri Lanka with specification to Kandy district.

Materials and methods

The present study used a deductive approach utilizing both primary and secondary data. The primary data collection was obtained through a pre-tested, interviewer-administered questionnaire and field observations. The secondary data was gathered from the Department of Census and Statistics, the Ministry of Livestock and Rural Community Development and the reports from the Central Bank. The questionnaire was developed to assess consumer perception, purchasing behavior, and consumption patterns concerning broiler chicken meat. In sampling, the number of questionnaires was decided based on the district's population. A total of 460 respondents from Kandy district were selected using a simple random sampling method. Kandy district was deliberately chosen for the study because (i) of having a higher number of poultry farms (11,156), (ii) it ranks the fifth and eleventh in terms of the overall number of poultry farms and broiler farms in Sri Lanka, respectively, and (iii) as a central provincial district where the poultry industry is dominant (Alahakoon et al., 2016; Census and Statistics, 2020). Collected data were recorded and were processed in a database formed in Statistical Package for Social Sciences (SPSS - version 22) and Microsoft Excel 2016 software. The data were analyzed using descriptive statistics, including frequency analysis, and Pearson's chi-squared test was used to determine the relationship between the variables obtained.

Results and discussion

Socio-economic background of the respondents

According to the findings, the majority of the respondents were male (52.6%) and were unmarried (55.4%) (Table 1). The most common age group participated in the survey ranged between 18 and 30 years (53.9%). Moreover, 45.4% of the respondents were urban dwellers, whereas 54.6% were rural dwellers. The majority of the responders (48.9%) have completed their higher education (graduated or are currently enrolled in postgraduate programs), whereas 46.3% of the sample have completed their secondary education. Most respondents stated their primary occupation as "other" (41.1%) and earn between Rs. 25,000 and Rs. 50,000 per season/month.

Response to the questionnaire

The results indicated that 85.4% of the total respondents consume broiler meat. Those who do not prefer broiler meat (14.6%) were given with the reasons (i) unpalatability (41.9%), (ii) concerns about how the broilers are raised (24.7%) and (iii) the religious beliefs (18.3%) as reasons for their rejection (Figure 2).

According to the study conducted in the southern province of Sri Lanka (de Silva et al., 2010), the respondents claimed the religious beliefs (74%), economic concerns (47%) and antipathy toward killing animals (82%) as reasons for refrain from eating broiler meat. Similarly, several other authors have found that the religious views have a significant impact on meat consumption patterns (Delener, 1994; Pettinger et al., 2019). However, the current study revealed that the religious beliefs (18.3%) play a minor role in not being a broiler chicken meat consumer, while economic concerns are also least affected or almost (0%) zero when compared to de Silva et al. (2010). However, it is obvious that the percentage of participants in the present study who do not consume chicken due to their religious beliefs has declined. Thus, it seems that the attitudes of the consumers have shifted over the time, positively for alleviating malnutrition in the country.

In spite of reputation of broiler meat as healthy white meat, the chicken was more popular among females than males (de Silva et al., 2010). However, in contrast, the current study revealed that the males (89.3%) are more interesting on consuming chicken meat than the females (81.2%). Furthermore, this will express that the attitude and preference of the community can be changed time to time.

The correlations between the consumption of broiler chicken meat with other sample variables like gender, age, and income are presented in Tables 2, 3 and 4, respectively. The Chi-square tests indicated a statistically significant positive relationship between gender and chicken consumption ($p=0.014$), thereby rejecting the null hypothesis (Table 2). However, there is no significant correlation between chicken consumption and income level ($p=0.141$) with the factors such as education and occupation.

Table 1. Socio-economic background of the respondents

Characteristics	Frequency	Percent (%)
Gender		
Male	242	52.6
Female	218	47.4
Age		
Below 18 years	20	4.3
Between 18 – 30 years	248	53.9
Between 30 – 60 years	137	29.8
Over 60 years	55	12.0
Locality		
Urban	209	45.4
Rural	251	54.6
Marital status		
Married	205	44.6
Unmarried	255	55.4
Highest education level		
Primary education	22	4.8
Secondary education	213	46.3
Higher education	225	48.9
Working sector		
Government	86	18.7
Private	139	30.2
Self-employment	46	10.0
Other (include jobless)	189	41.1
Income level (Rs.)*		
Below 25,000	152	33.0
Between 25,000 – 50,000	155	33.7
Between 50,000 – 100,000	107	23.7
Over 100,000	46	10.0

* Sri Lankan Rupees (LKR); Source: Field Survey from November 2021 to January 2022.

Table 2. Chi-square test results: Gender and consumption of broiler meat

Gender × Broiler meat consumption	Value	Degree of freedom	Asymptotic significance (2-sided)	Exact significance (2-sided)	Exact significance (1-sided)
Pearson Chi-Square	5.993[a]	1	0.014		
Continuity Correction[b]	5.362	1	0.021		
Likelihood Ratio	6.011	1	0.014		
Fisher's Exact Test				0.017	0.010
Linear-by-Linear Association	5.980	1	0.014		
Number of Valid Cases	460				

[a]Chi-square test results (Gender Vs. broiler meat consumption) 0 cells (0.0%) have expected count less than 5. The minimum expected count is 37.75; [b]Computed only for a 2x2 table; Source: Field Survey from November 2021 to January 2022.

Table 3. Chi-square test results: Age and broiler meat consumption

Age × Do you consume broiler meat?	Value	Degree of freedom	Asymptotic significance (2-sided)
Pearson Chi-Square	10.713[a]	3	0.013
Likelihood Ratio	9.741	3	0.021
Linear-by-Linear Association	9.736	1	0.002
Number of Valid Cases	460		

[a]1 cells (12.5%) have expected count less than 5. The minimum expected count is 2.91.; Source: Field Survey from November 2021 to January 2022.

Table 4. Chi-square test results: Income level and broiler meat consumption

Income level × Consumption of broiler meat	Value	Degree of freedom	Asymptotic significance (2-sided)
Pearson Chi-Square	5.466[a]	3	0.141
Likelihood Ratio	6.623	3	0.085
Linear-by-Linear Association	1.126	1	0.289
Number of Valid Cases	460		

[a]0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.70.; Source: Field Survey from November 2021 to January 2022.

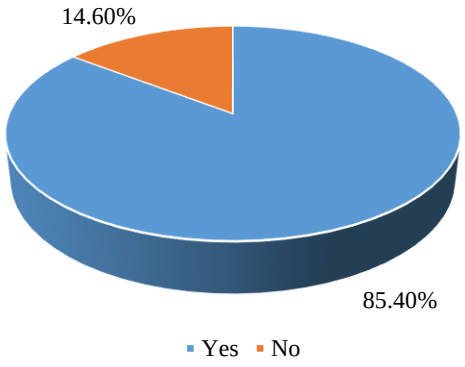

Figure 1. Preference for broiler meat consumption.
Source: Field Survey from November 2021 to January 2022.

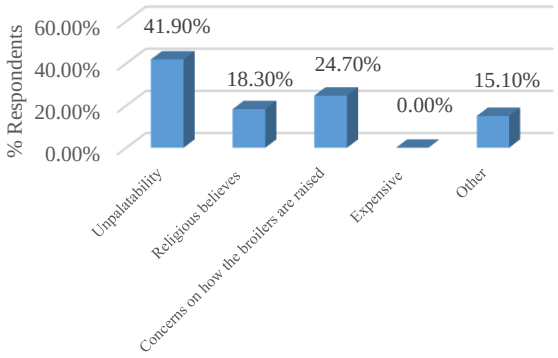

Figure 2. Reasons for not consuming broiler chicken meat.
Source: Field Survey from November 2021 to January 2022.

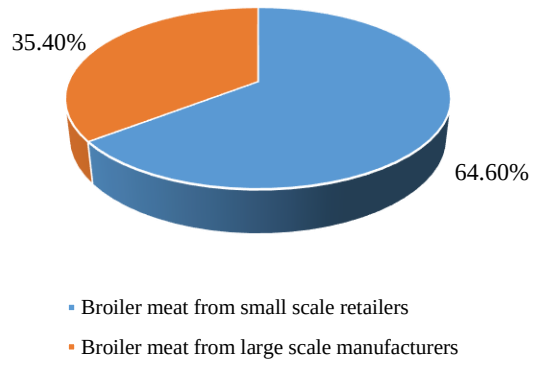

Figure 3. Broiler meat purchasing behavior.
Source: Field Survey from November 2021 to January 2022.

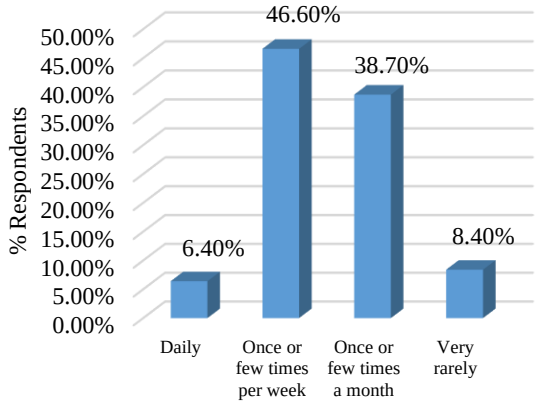

Figure 4. Frequency of consuming broiler meat.
Source: Field Survey from November 2021 to January 2022.

Table 5. Chi-square test results: Income level and frequency of consuming broiler meat

Income level × Broiler meat consumption frequency	Value	Degree of freedom	Asymptotic significance (2-sided)
Pearson Chi-Square	38.935[a]	9	0.000
Likelihood Ratio	44.967	9	0.000
Linear-by-Linear Association	16.010	1	0.000
Number of Valid Cases	393		

[a]2 cells (12.5%) have expected count less than 5. The minimum expected count is 2.80.; Source: Field Survey from November 2021 to January 2022.

Table 6. Chi-square test results: Highest education level and knowledge about broilers length of production

The highest educational level x consumer knowledge about broiler chicken reaches their market weight within a short period	Value	Degree of freedom	Asymptotic Significance (2-sided)
Pearson Chi-Square	33.788[a]	2	0.000
Likelihood Ratio	31.996	2	0.000
Linear-by-Linear Association	31.106	1	0.000
Number of Valid Cases	393		

[a]0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.98.; Source: Field Survey from November 2021 to January 2022.

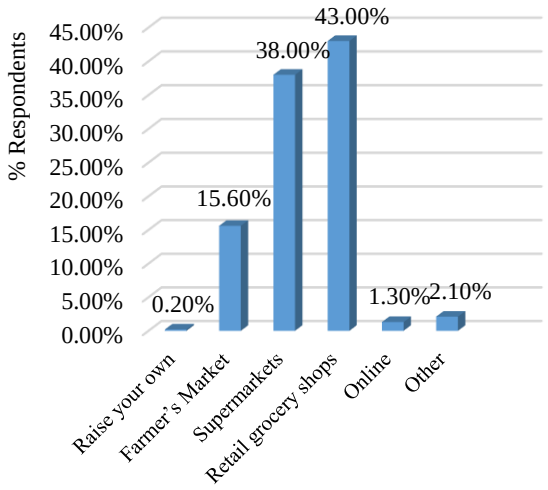

Figure 5. The purchasing behavior of broiler meat.
Source: Field Survey from November 2021 to January 2022.

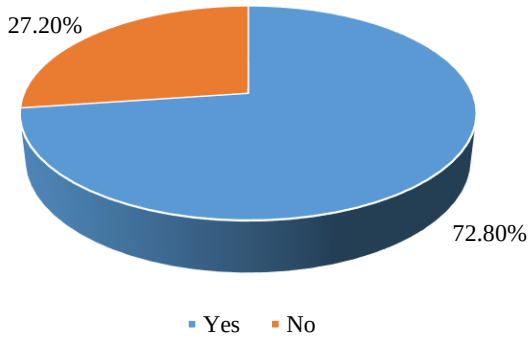

Figure 6. Awareness on production length of broilers.
Source: Field Survey from November 2021 to January 2022.

This is in a complete agreement with the findings of de Silva et al. (2010), as gender was found to have a significant effect on meat consumption while no significant correlation exists between meat consumption and educational level. Nevertheless, significant correlations exist between the chicken consumption and age (Table 3). Moreover, having an inverse relationship, it was proven that with the age, they become more health conscious and thus reduce their meat consumption (He et al., 2003; de Silva et al., 2010).

The purchase behavior focuses primarily on customer preferences for spending their resources on meat-related items (de Silva et al., 2010). The meat purchasing behavior indicated that the majority of the respondents purchase broiler meat from the small-scale retailers (64.6%), while the rest (35.4%) purchase broiler meat from the large-scale manufacturers (Figure 3).

According to Figure 4, nearly 46.60% of the participants consume broiler meat once or a few times a week. This is followed by a frequency of once or a few times a month (38.70%). The least number of respondents consume either broiler meat daily (6.40%) or very rarely (8.40%). However, studies conducted in Turkey and Finland revealed that the majority of the society consumes broiler meat for a frequency of once or twice a week which implies that all three countries have relatively the same consumption frequencies (Pouta et al., 2010; Durmuş et al., 2012).

Moreover, the chi-square analysis indicates a statistically significant positive relationship (p=0.000012) between the income level and the consumption frequency (Table 5). This is in an agreement with Putnam and Gerrior (1997), who found that the purchasing power of meat and consumption habits are primarily determined by income, price, flavor, and preferences.

Most consumers purchase broiler meat from retail groceries (43.00%) and supermarkets (38.00%), whereas the retail groceries and supermarkets are the dominant suppliers of the food supply chain in Sri Lanka. However, the others mentioned farmers' markets (15.60%) and online stores (1.30%) as the places where they purchase broiler meat.

Of the sample, 50.40% of the respondents had an idea on broiler production while the rest (49.50%) did not have.

Furthermore, only 72.80% of the total respondents were knowledgeable about the fact that the broiler chicken reach to their market weight within a short period, while 27.20% said that they did not aware of it (Figure 6). According to the chi-square analysis, there is a positive relationship between the educational level and consumer knowledge on broiler chickens' short production period (Table 6).

A significant quota of the sample (85.9%) believes that the hormones are used for broiler chicken at the production level, and a similar percentage (83.7%) believes that these substances pose health hazards to human (Figure 7). The study also found that the general public (36.2 %), followed by the print media (Newspapers, books and magazines etc.) (30.80%), were the sources that respondents perceived this false information concerning hormone use (Figure 8). Interestingly, the present study revealed that 75.7% of the respondents were unaware about the fact that the hormones such as anabolic steroids (i.e. Testosterone, progestogens, stilbene, oestradiol, and estrogen) are banned in Sri Lankan broiler production (Gazette No. 1,292, 06.06.2003), and 71.4% of them have stated that hormones are still being used illegally in broiler production in Sri Lanka. In another study conducted to assess consumer awareness on broiler nutrition with antibiotics and hormones in Istanbul, turkey, revealed that 88.3% of the consumers believed that the hormones are used in broiler chicken feeding, whereas 11.7% believed that it is not (Karasu and Ozturk, 2020). So both studies imply that the consumers have a generally poor understanding of the livestock industry, even though hormones are not permitted by law to be used in poultry.

However, Results from the Chi-square analysis prove that there is no correlation between respondents' level of education and their views on the use of hormones in broiler chicken production (p=0.732). Similarly, there is no correlation exists between the respondents' field of employment and their views on the use of growth hormones in broiler chicken production (Table 7). However, the current results do not agree with the results of the study conducted in Kars province in Turkey, as it demonstrated that the percentage of those who think that the chicken meat is risky in terms of hormones and antibiotics is also increased with the advancement of consumers' education level. And also, it reported that the news from the media is the most crucial factor triggering this decision (Ayvazoğlu Demir and Aydın, 2018).

Table 7. Chi-square test results: Profession and hormone use perception

Profession × Do you think that the hormones are used to gain a rapid growth rate in broilers?	Value	Degree of freedom	Asymptotic significance (2-sided)
Pearson Chi-Square	5.277[a]	3	0.153
Likelihood Ratio	5.899	3	0.117
Linear-by-Linear Association	4.277	1	0.039
Number of Valid Cases	460		

[a]0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.50; Source: Field Survey from November 2021 to January 2022.

Table 8. Chi-square test results: Highest education level and perception of frequent eating of broiler meat can cause early puberty in adolescent girls

The highest educational level × Do you think that eating broiler meat frequently during childhood leads to the earlier onset of puberty in adolescent girls?	Value	Degree of freedom	Asymptotic significance (2-sided)
Pearson Chi-Square	2.728[a]	2	0.256
Likelihood Ratio	2.530	2	0.282
Linear-by-Linear Association	0.053	1	0.818
Number of Valid Cases	460		

[a]0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.12.; Source: Field Survey from November 2021 to January 2022.

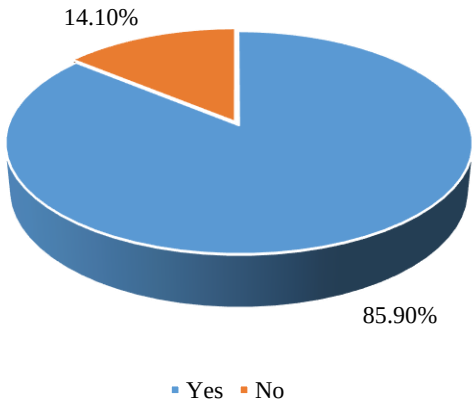

Figure 7. Perception on hormone use in broiler production.
Source: Field Survey from November 2021 to January 2022

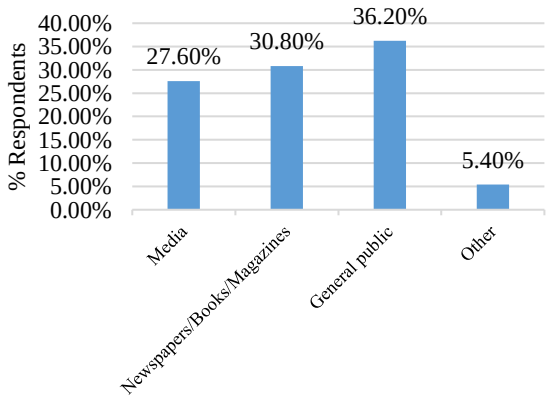

Figure 8. Sources that perceive misconceptions.
Source: Field Survey from November 2021 to January 2022.

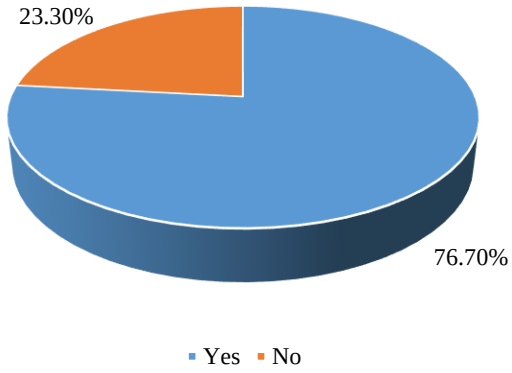

Figure 9. Perception on frequent broiler meat consumption can cause early onset of puberty in adolescent girls.
Source: Field Survey from November 2021 to January 2022.

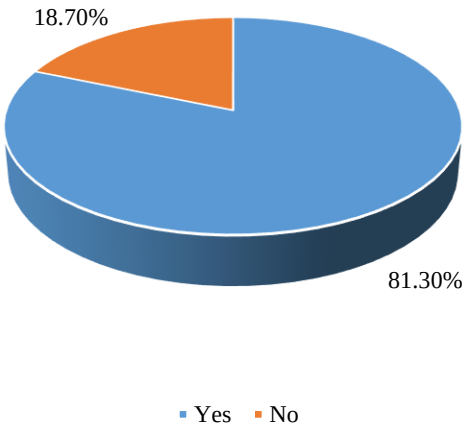

Figure 10. Attitudes of the consumers to change their mindset if the broilers are ensured and certified with ‘‘no added hormones’’ during the production.
Source: Field Survey from November 2021 to January 2022.

Furthermore, the respondents participated in the current survey (76.7%) highly agreed with the fact that the adolescent girls who consume broiler meat regularly during their childhood may experience early puberty (Fig. 9). According to the results of the current study, it has been revealed that the most of the respondents (42.10%) gathered this misinformation from the general public.

No correlation exists between the level of education and the notion that consuming broiler meat frequently can cause early puberty in adolescent girls (p=0.256) (Table 8).

Hormone usage in livestock production is controversial due to safety concerns. According to the research conducted in 1995 by the Food Marketing Institute, 50% of the consumers considered hormones as a severe health risk. Of the different consumer concerns related to broiler industry, the concerns on hormone usage and other growth boosters ranked the highest than the concerns on antibiotics, preservatives and additives but comparatively lower than the concerns on microbial spoilage and chemicals (Alahakoon et al., 2016). Moreover, some studies revealed that not all customers have the same confidence in the statistical claims made in the experiments, advertisements and surveys (Hayes et al.. 1995). However, Sri Lanka seemed to pose a different scenario, while the most of the people rely on information gather from the general public. However, the majority of the respondents (81.3%) agreed to change their mind-set if the relevant authority would ensure that the broiler chickens are certified with no added hormones during their production cycle (Figure 10).

Several studies demonstrated that there has been a significant increase in the demand for food transparency information, disclosing that the food labels have a significant impact on demand and customer purchases (Liaukonyte et al., 2013; Yang et al., 2020). Although, consumers depend on food labels to make informed choices about what they consume the rise of “antibiotic-free” and “hormone-free” labelled meat on supermarket shelves shows how labels can be both informative and misleading. Therefore, consumers’ perception of hormone usage impacts their selection of unlabelled meat products. Therefore, adopting these labels as a marketing tool confuses consumers and creates doubts about the meat safety. Thus, it implies that various factors, including safety guarantee, availability of exact information, quality assurance of the product, convenience and attention to animal welfare, play a significant role in determining customer satisfaction with meat and its products (Alahakoon et al., 2016). Reasonable efforts should be made to raise public awareness to dispel widespread myths and alter unfavourable perceptions of consumers about broiler chicken.

The sample size of the present study is representative of 1 of 25 districts in Sri Lanka. Therefore, generalization of the findings of this study should be approached with a care since the whole sample consists of customers from a single region called Kandy district. Perhaps, it may not reflect the perceptions of all Sri Lankans. In addition, it is essential to highlight that the focus of this study was on customer behaviour intentions rather than actual behaviour. Consequently, Future studies must examine a larger sample size that encompasses the entire island so that the results may be generalized to all Sri Lankan consumers.

Conclusions

This study concluded that the misconceptions of (i) use of hormones to acquire high growth rates in broilers, (ii) hormones assumed to be present in broiler meat pose health concerns to people and (iii) frequent consumption of broiler meat during childhood is associated with the early onset of puberty in adolescent girls, do exists. Though the majority of the sample comprises of highly educated professionals, these misinformation were spreaded from the information generated among the general public. Stipulating valid certification with no added hormone in broiler chicken meat will change the mind-set of general public. Therefore, uplifting the public awareness on legal background on hormone usage in food animals and accurate product labelling procedures are warranted.

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