



Assessment of Effect of Consumers' Age on Meat Consumption Pattern and Awareness in Ludhiana City

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ABSTRACT

The present study examined effect of age of consumers on consumption pattern, awareness and hygienic practices adopted for meat and its products in various zones of Ludhiana city through contact survey method. A questionnaire/interview schedule was designed comprising questions related to meat consumption, processing pattern, awareness of consumers regarding type of meat and hygiene. A total sample size of 800 respondents was taken and the survey was conducted by dividing Ludhiana city into four imaginary zones, namely; Zone I, II, III and IV by using a random sampling method. Consumers of three different age groups (<25, 25-35, and >35) were assessed and it was observed that irrespective of any age group, the preference for poultry meat was significantly higher. The respondents in younger age group were frequent meat eaters and had higher preference for processed products. More than 80% of respondents in age group of 25-35 years and above 35 years stated that they were unaware of government policies for meat production and export in India whereas, the number was comparatively lower in age group of less than 25 years. It can be concluded that young age groups are more aware of meat production and consumption as compared to older groups.

HIGHLIGHTS

- The entire three groups stated that they were not aware of the Food Safety and Standards Act (FSSA) in meat production and governmental policies being followed in country for the same.
- More than 70% of respondents in all the age groups responded negatively for preference of meat consumption from road side vendors.

Keywords: Meat consumption, Behaviour, Survey, Consumer age, processing pattern

The people in a society have specific traditions which decide the pattern of food consumption in an area. The changes in socioeconomic factors in recent years has increased the consumer's preference for ready to eat foods including meat products (Mehta *et al.*, 2013; Mehta *et al.*, 2015). Diversification of consumers towards high value commodities is an indication of overall development and progression (Birthal, 2008). In India, past two decades has shown a rising demand for animal driven products. Due to rapid increase in the household income, urbanization and changing lifestyle, there has been a shift in consumers towards non-traditional and value-added products. Now a days, economic lifestyle, awareness and consumer's

attitudes towards food regarding quality are getting consistent all around the world. The quality of food derived from animals, particularly meat and meat products, is becoming increasingly important for all members of society as income rise in relation to the cost of living and consumers usually tend to spend more on animal protein products than before (Aumaitre, 1999). Simultaneously, as consumer understanding about the food they consume has

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grown, consumers have become increasingly mindful of their health and vigilant about the food's quality (Singh *et al.*, 2019).

Meat being perishable is required to be free from diseases from the point to production till the consumption. Many pathogenic microorganisms are known to grow in the meat if hygienic procedures are not followed. The major diseases that may spread through meat are bacterial, protozoan, and helminthic. It is observed that along with meat, water used for meat processing also carries some diseases (Campylobacteriosis, Amoebiasis, and Ascariasis) to human being during unhygienic handling of meat and its products, particularly in unorganized sector in developing countries like India. Furthermore, a majority of consumers consume meat that has been slaughtered and butchered at small, local shops where hygienic standards are never guaranteed. A mere five percent of the chicken meat produced in India comes from organised processing facilities; the majority comes from the birds slaughtered in the unorganised sector (retail shops), where there is a high risk of infection because of inadequate cleanliness (Kumar *et al.*, 2001). The poor hygiene and sanitation prevailing in the premises encourage microbial contamination, survival and growth. There has been a number of food borne illness resulting from the ingestion of contaminated foods such as chicken meats. The majority of pathogens involved in foodborne illnesses originate from zoonotic organisms (Busani *et al.*, 2006). The age of consumers can be a critical factor in changing the consumption attitude and trend as it is an important socio psychological determinant. This study was undertaken to assess effect of age of consumers on consumption and processing pattern, awareness and hygienic considerations for meat in Ludhiana city through sample survey.

MATERIALS AND METHODS

The present study was carried out to assess the effect of age of consumers on consumption and processing pattern, awareness and hygienic considerations for meat in different zones of Ludhiana city through sample survey. A bilingual questionnaire comprising questions related to meat consumption, processing pattern, awareness of consumers regarding type of meat and hygiene was designed as per Singh *et al.* (2019). A total sample size of 800 respondents was taken for the survey by dividing Ludhiana city into

four hypothetical zones, namely; Zone 1, 2, 3 and 4, by using a random sampling method (Yamane 1967). Three distinct parameters viz. meat consumption and processing, consumer awareness, and the hygiene practices adopted, were taken into consideration. All of the questions were dispersed under these three headings for computation and analysis of responds by 800 respondents in all four zones of Ludhiana city. The respondents in this study were divided into three groups on the basis of age viz. under 25 (<25), 25-35 and above 35 (>35). Data obtained through the questionnaires was analyzed using the descriptive statistics and frequency tables in the Statistical Analysis System (SAS). The analysis of the data was done by the chi square, one-way ANOVA and 2-way ANOVA test.

RESULTS AND DISCUSSION

Effect of age of consumers on consumption and processing pattern, awareness and hygienic considerations for meat

The respondents in this study were divided into three groups on the basis of age viz. under 25 (<25), 25-35 and above 35 (>35) and the results are expressed in Table 1. The results indicate that irrespective of any age group (<25, 25-35, and >35), the preference for poultry meat was significantly higher ($p < 0.01$) as compared to red meat and pork, with values ranging from 53.66 to 59.62%. This could be due to readily availability of poultry meat in the city and non-biasness associated with its consumption. Babu *et al.* (2010) revealed in their study that the preference of people was found to be maximum for poultry meat (70.0%) followed by mutton (21.0%), chevon (7.0%) and very less percentage of people preferred pork (1.0%) and beef (1.0%). Similar findings have been reported by Koizumi *et al.* (2001) and Raju *et al.* (2005). The analysis depicted that in all the age groups, majority of people preferred hot served meat than shelf packed (81.39% to 89.63%). It might be due to the cultural conditioning in Indian population. Some cultures prefer cold food over hot processed e.g. Baltic countries, whereas Asian cultures place a lot of emphasis on hot served food.

The analysis of response to the question of preference for cut-up part in poultry carcass revealed that chicken leg was the first choice ($p < 0.01$) in all age groups (<25, 25-35, and >35) ranging from 34.17% to 49.53%. Similar

Table 1: Effect of age of consumers on consumption and processing pattern of meat and its products

Question	Options	Age of Consumers (Years)			P-value
		Below 25 (Group 1)	25-35 (Group 2)	Above 35 (Group 3)	
Which meat do you prefer to consume?	Red	65 (20.50%)	85 (20.65%)	60 (36.59%)	0.0006
	Poultry	189 (59.62%)	188 (58.93%)	88 (53.66%)	
	Pork	16 (5.05%)	4 (1.25%)	7 (4.27%)	
	All of them	42 (13.25%)	37 (11.60%)	9 (5.49%)	
What do you prefer: Shelf-packed/ Hot served meat	None	5 (1.58%)	5 (1.57%)	0 (0.00%)	0.0187
	Shelf-packed	59 (18.61%)	39 (12.23%)	17 (10.37%)	
In Poultry, which Carcass part you prefer?	Hot served meat	258 (81.39%)	280 (87.77%)	147 (89.63%)	0.0026
	Whole carcass	75 (23.66%)	107 (33.54%)	52 (31.71%)	
	Chest	63 (19.87%)	63 (19.75%)	31 (18.90%)	
	Wing	22 (6.94%)	40 (12.54%)	16 (9.76%)	
How often do you consume meat?	Leg	157 (49.53%)	109 (34.17%)	65 (39.63%)	<.0001
	Every day	23 (7.26%)	14 (4.39%)	8 (4.88%)	
	Once in a week	84 (26.50%)	89 (27.90%)	50 (30.49%)	
	1-3 times a week	90 (28.39%)	138 (43.26%)	58 (35.37%)	
	3-5 times a week	40 (12.62%)	50 (15.67%)	28 (17.07%)	
Which processed meat product you prefer?	Once in Month	80 (25.24%)	28 (8.78%)	20 (12.20%)	0.2231
	Nuggets	92 (29.02%)	78 (20.45%)	47 (28.66%)	
	Patties	33 (10.41%)	46 (14.42%)	19 (11.59%)	
	Meat Balls	61 (19.24%)	51 (15.99%)	23 (14.02%)	
	Sausages	68 (21.45%)	87 (27.27%)	35 (21.34%)	
Which traditional meat you prefer?	Other	63 (19.87%)	57 (17.87%)	40 (24.39%)	0.8723
	Soup	25 (7.89%)	19 (5.96%)	12 (7.32%)	
	Tandoori	171 (53.94%)	173 (54.23%)	86 (52.44%)	
	Kababs	57 (17.98%)	59 (18.50%)	26 (15.85%)	
	Pickle	32 (10.09%)	37 (11.60%)	17 (10.37%)	
Which meat processing do you prefer	Any other	32 (10.09%)	31 (9.72%)	23 (14.02%)	0.0051
	Hot Processing	195 (61.51%)	161 (50.47%)	84 (51.22%)	
Will you prefer the branded outlets (KFC, McDonalds) over traditional meat market	Cold Processing	122 (38.49%)	158 (49.53%)	80 (48.78%)	<.0001
	Yes	221 (69.72%)	209 (65.52%)	51 (31.10%)	
	No	96 (30.28%)	110 (34.48%)	113 (68.90%)	

findings have been reported by Raghavendra *et al.* (2009) who observed that in both urban and rural households of Dharwad district of Karnataka state, higher preference for leg piece in chicken carcass was there as compared to other cut-up parts. The frequency of consumption of meat in all the three age groups (<25, 25-35, and >35), was found to be 1 to 3 times a week (28.39% to 43.26%). However, the respondents in 25-35 age group had higher representation in this category as compared to other two groups. Contrary to our findings, Durmuş *et al.* (2012) showed

that consumption frequencies for poultry meat were once a week (43.64%), twice a week (34.79%), three times a week (16.67%), four times a week (3.58) and five times a week (1.32) in Turkey. This might be due to the fact that preference of poultry meat other than Indian subcontinent is lesser. As far as the preference of type of processing meat was concerned, a significantly ($p<0.01$) higher value for hot processing (51.22% to 61.51%) was observed. Durmus *et al.* (2012) also stated that boiling was preferred by consumers as a cooking method with a rate of 44.73%.

The respondents in age group <25 and 25-35 years of age preferred ($p<0.01$) branded outlets over traditional meat market whereas >35 age group had significantly ($p<0.01$) higher preference for traditional meat market than branded outlets like KFC and McDonalds. This could be due to higher inclination of youth towards processed products with branding (Fig. 1).



Fig. 1: Effect of age of respondents on choice of branded outlets and traditional meat markets

Effect of age of consumers on awareness regarding consumption of meat and its products

When the awareness factor is compared with age (Table 2), all age groups (<25, 25-35, and >35) preferred red/poultry/pork meat because it is tastier, nutritious and healthier (51.10% to 64.63%). Respondents in all age groups (<25, 25-35, and >35) were satisfied with hygiene adopted during processing of meat and a significantly ($p<0.01$) higher number of respondents were reported in age group of below 25 who thought that the meat they consume is hygienically processed. The analysis of query regarding safety of frozen packed meat revealed that the respondents in age group below 25 years and above 35 years were of opinion that frozen meat is stale/ unsafe for use whereas the respondents in age group 25-35 years of age ($p<0.01$) rendered frozen packed meat safe for consumption and 59.25% of people in this age group were in agreement (Fig. 2).

This could be due to awareness amongst this group regarding safety of food they consume whereas other age

groups were either having a disliking or lack of knowledge about the frozen products. The findings are in accordance with Durmus *et al.* (2012).

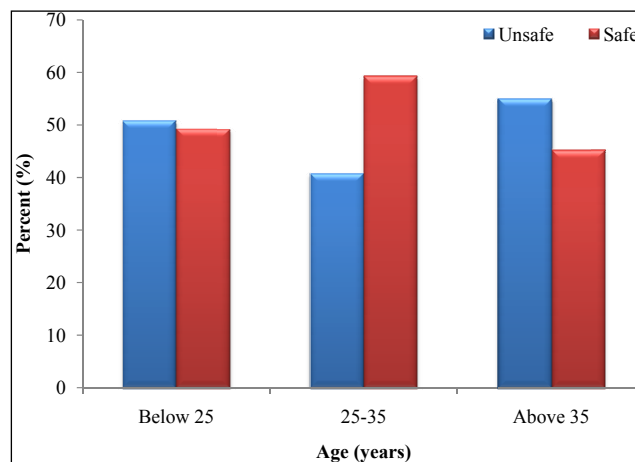


Fig. 2: Effect of age of respondents on response regarding safety of frozen packed meat

The results of this study showed that there was a prejudice against frozen products in majority of consumers and that the people should be informed about these products. Awareness about processed and traditional meat products was reported in majority of people, irrespective of their age groups and it ranged from 81.71 to 91.22% and 87.20 to 93.42 % for processed and traditional products, respectively. Similar findings have been reported by Magdelaine *et al.* (2008) for processed chicken products in the EU countries. A higher inclination of consumers towards these products was attributed to shorter processing time. In response to the effect of age of poultry bird on its taste, the respondents stated that they were unaware of the same (53.66% to 69.72%) and a significantly ($p<0.01$) lesser number of people were in age group below 25 years. Majority of consumers expressed inability to judge broiler or spent hen meat by tasting it. This could be due to lack of knowledge in respondents regarding muscle structure and texture.

A significantly ($p<0.01$) higher number of respondents were unaware of the Food Safety and Standards Act (FSSAI) in meat production, irrespective of age groups. The value ranged from 54.89 to 79.27%. All the three groups (<25, 25-35, and >35) stated that the shop/ retail outlet from where they purchase meat is not FSSAI registered or HACCP certified (45.37% to 78.06%). More than 80% of

Table 2: Effect of age of consumers on awareness regarding consumption of meat and its products

Question	Options	Age of Consumers (Years)			P-value
		Below 25 (Group 1)	25-35 (Group 2)	Above 35 (Group 3)	
Why do you prefer red/poultry /pork meat?	Tastier/Nutritious/Healthier	162 (51.10%)	205 (64.26%)	106 (64.63%)	0.0009
	Cheaper/ Easy access	155 (48.90%)	114 (35.74%)	58 (35.37%)	
Do you think Red Meat/Poultry/Pork you consume is hygienically processed	No	103 (32.49%)	146 (45.77%)	78 (47.56%)	0.0005
	Yes	214 (67.51%)	173 (54.23%)	86 (52.44%)	
Do you think frozen packed meat is stale/ unsafe	Yes	161 (50.79%)	130 (40.75%)	90 (54.88%)	0.0046
	No	156 (49.21%)	189 (59.25%)	74 (45.12%)	
Have you heard of processed meat products?	Yes	282 (88.96%)	291 (91.22%)	134 (81.71%)	0.0078
	No	35 (11.04%)	28 (8.78%)	30 (18.29%)	
Have you heard of traditional meat products?	Yes	293 (92.43%)	298 (93.42%)	143 (87.20%)	0.0534
	No	24 (7.57%)	21 (6.58%)	21 (12.80%)	
Do you have any knowledge about age group of poultry affecting taste of meat?	No	221 (69.72%)	189 (59.25%)	88 (53.66%)	0.0010
	Yes	96 (30.28%)	130 (40.75%)	76 (46.34%)	
Can you judge broiler or spent hen meat by tasting it?	No	205 (64.67%)	193 (60.50%)	83 (50.61%)	0.0050
	Yes	112 (35.33%)	126 (39.50%)	81 (49.39%)	
Are you aware of Food Safety and Standards Act (FSSAI) in meat production?	No	174 (54.89%)	220 (68.97%)	130 (79.27%)	<.0001
	Yes	143 (45.11%)	99 (31.03%)	34 (20.73%)	
Do you think the shop/ retail outlet from where you purchase meat is FSSAI registered or HACCP Certified?	No	208 (65.62%)	249 (78.06%)	140 (45.37%)	<.0001
	Yes	109 (34.38%)	70 (21.94%)	24 (14.63%)	
Do you think proper cooking at home kills all the pathogens in the meat?	No	89 (28.08%)	68 (21.32%)	35 (21.34%)	0.0915
	Yes	228 (71.92%)	251 (78.68%)	129 (78.66%)	
Are you aware of Animal welfare issues for slaughter like humane slaughter?	No	167 (52.68%)	163 (51.10%)	86 (57.56%)	0.9159
	Yes	150 (47.32%)	156 (48.90%)	78 (52.44%)	
Are you aware of Government policies for meat production and export in India	No	213 (67.19%)	256 (80.25%)	145 (88.41%)	<.0001
	Yes	104 (32.81%)	63 (19.75%)	19 (11.59%)	
Are you aware of the potent environmental hazards by disposal of untreated slaughter house by products	No	165 (52.05%)	201 (63.01%)	117 (71.43%)	0.0001
	Yes	152 (47.95%)	118 (36.99%)	47 (28.66%)	

respondents in age group of 25-35 years and above 35 years stated that they were unaware of government policies for meat production and export in India whereas, the number was comparatively lower (67.19%) in age group of less than 25 years. Awareness regarding potent environmental hazards by disposal of untreated slaughter house by products was significantly ($p < 0.01$) lower in respondents irrespective of age group and the value ranged from 52.05 to 71.43%. However, the younger consumers were better aware than older ones.

Effect of age of consumers on hygienic considerations of meat and its products

Effect of age on hygienic considerations in meat production and processing revealed that majority of consumers in each age group preferred the purchase of meat from butcher shop (41.32% to 62.80%) and it was significantly ($p < 0.01$) higher in comparison to super market or slaughtering by self (Table 3). The analysis of responses revealed that the respondents from all the age groups marked red meat as a healthier option. According to Reicks *et al.* (2011), a

Table 3: Effect of age of consumers on hygiene considerations regarding consumption of meat and its products

Question	Options	Age of Consumers (Years)			P-value
		Below 25 (Group 1)	25-35 (Group 2)	Above 35 (Group 3)	
What are the criteria to purchase raw meat?	Freshness	10 (3.15%)	4 (1.25%)	1 (0.61%)	0.1674
	Cost	25 (7.89%)	30 (9.40%)	13 (7.93%)	
	Health	235 (74.13%)	253 (79.31%)	131 (79.88%)	
	Social issues	47 (14.83%)	32 (10.03%)	19 (11.59%)	
From where do you purchase meat?	Butcher Shop	131 (41.32%)	179 (56.11%)	103 (62.80%)	0.0002
	Super Market	51 (16.09%)	33 (10.34%)	19 (11.59%)	
	Slaughter at home	28 (8.83%)	17 (5.33%)	6 (3.66%)	
	No preference	107 (33.75%)	90 (28.21%)	30 (21.95%)	
Which one you think is healthier?	Pork	64 (20.19%)	38 (11.91%)	21 (12.80%)	0.0504
	Red meat	169 (53.31%)	187 (58.62%)	94 (57.32%)	
	Poultry	84 (26.50%)	94 (29.47%)	49 (29.88%)	
Have you ever encountered stale/unhygienic meat served to you?	No	204 (64.35%)	243 (76.18%)	119 (72.56%)	0.0040
	Yes	113 (35.65%)	76 (23.82%)	45 (27.44%)	
If Yes, has it changed your mindset to consume meat again?	Yes	193 (60.88%)	182 (57.05%)	102 (62.20%)	0.4642
	No	124 (39.12%)	137 (42.95%)	62 (37.80%)	
Did any of diseases like Avian flu/Swine flu impacts your consumption pattern?	No	142 (44.79%)	113 (40.75%)	53 (32.32%)	0.0305
	Yes	175 (55.21%)	189 (59.25%)	111 (67.68%)	
Do you prefer to consume meat from road side vendors?	Yes	82 (25.58%)	80 (25.08%)	44 (26.83%)	0.9151
	No	235 (74.13%)	239 (74.92%)	120 (73.17%)	
Are you satisfied with the hygiene conditions adopted by them?	Yes	100 (31.55%)	77 (24.14%)	37 (22.56%)	0.0428
	No	217 (68.45%)	242 (75.86%)	127 (77.44%)	

survey conducted among 1370 consumers in the United States of America revealed that individuals aged 30 years and above were more influenced by the nutritional value of beef before making a purchase decision than younger respondents and proposed this to be the result of their heightened awareness of nutrient composition of foods and an increased health concern. 64.35% to 76.18% of respondents stated that they have never encountered stale/unhygienic meat served to them while, 55.21% to 67.68% of the people agreed that avian flu/swine flu impacted their consumption pattern. The statistically negative impact of these diseases on consumption pattern have also been reported by Mu *et al.* (2015) in consumers of United States of America and Kraipornsak (2010) in meat consumption pattern in Thailand. More than 70% of respondents in all the age groups responded negatively for preference of meat consumption from road side vendors. It could be attributed to poor hygienic conditions maintained by them which can be strengthened from the response of question whether

they were satisfied with the hygienic measures adopted by the road-side vendors, wherein, 68.45% to 77.44% of respondents were not satisfied with the hygienic measures adopted by the road-side vendors.

CONCLUSION

It can be concluded that irrespective of any age group (<25, 25-35, and >35), poultry meat was most preferred one as compared to red meat and pork. Majority of people prefer hot served meat than cold processed. The most preferred carcass cut of poultry in all the age groups was poultry leg. The maximum respondents were of the opinion that they consume meat 1-3 times a week. Similarly, when the awareness factor is compared with age, all age groups preferred poultry meat because it is tastier, cheaper and easy access. The results of this study showed that there was a prejudice against frozen products and that the people should be informed about these products. The

entire three groups stated that they were not aware of the Food Safety and Standards Act (FSSA) in meat production and governmental policies being followed in country for the same. Thus, there is a great need to educate consumers regarding issues related to meat quality and hygiene through trainings and awareness programmes.

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