

IMPACT OF BIRD FLU ON DEMAND OF CHICKEN MEAT IN FAISALABAD

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ABSTRACT: This paper seeks to identify the major factors affecting consumer demand of chicken meat in context of bird flu epidemic. Data were collected by personal interview method from the consumers of chicken meat, selected randomly from the Faisalabad city. The impact of independent variables (education, age, family size, income and dummy variable) was estimated using logit regression analysis. The highest odd ratio (1.60) was found for the dummy variable used to capture effect of low income on consumer demand for chicken meat followed by family size (1.45), education (-0.98), income (-0.96) and age (-0.91). The study emphasizes the role of public and private regulatory authorities to take measures for controlling bird flu and rumors related to it which shake confidence of consumers in purchasing chicken meat.

Key words: Bird flu, Chicken meat, Poultry, Demand, Logistic regression.

INTRODUCTION

Healthy food is very important attribute for many ultimate consumers. Poultry sector plays a dynamic function in the agriculture sector of Pakistan. The share of agriculture sector in Gross Domestic Product (GDP) during 2009-10 was 46.7 percent. Similarly the share of livestock sector (including poultry) during 2009-10 was 11.4 percent. The total poultry production was 610 million birds and total poultry meat production was 707 thousand tons in 2009-10. (Government of Pakistan, 2009-10). Poultry meat is a good source of cheap, palatable and nutritious food protein. A poultry enterprise produces meat in six weeks, and eggs in 24 weeks. It has been estimated that chicken appears in the diet of more people throughout the world than the meat from any other animal source. Poultry meat carries an advantage over red meat (beef and mutton) in terms of low percentage of fat and is therefore, termed as non-fattening and good dietary source for the prevention of hardening of arteries (Alam and Shaikh, 2007).

There was an outbreak of avian influenza, commonly referred to as "bird flu," caused by H5N1 strain of in February, 2006 in Pakistan. It was detected in layer and breeder poultry farms at Abbottabad, Charsada, Attock, Pindi Bhatian and Sehala and Tarlai areas of Islamabad. A flock of about 100 thousand birds was identified as infected and destroyed.

Many chicken consumers are not afraid to consume the chicken meat affected by bird flu epidemic. They argue that the meat is washed, treated with vinegar and cooked at a very high temperature (80 to 100 degrees

centigrade), killing completely bird flu virus (IRNA, 2008). At the same time consumer's doubts about this virus and its injurious effects may not be underestimated. In the recent past, this virus has severely hit poultry industry of many countries particularly developing ones to which Pakistan is no exception.

The major objective of this study was to identify the relevant and important variables (factors) related to the choice of the consumers to buy or not to buy the chicken meat during time of bird flu epidemic. The research findings may be used for the formulation of policies relating to ultimate consumers, demand and supply of chicken meat and related food products.

MATERIALS AND METHODS

The cross-sectional data were collected from the Faisalabad city from the respondents on both the qualitative and quantitative variables. A random sample of 100 consumers was interviewed to collect the data. The Logit model was used for data analysis. Logistic regression procedures are most commonly used for data analysis, when outcome variable is binary (Hosmer and Lemeshow, 2000). The Logit and Probit models have practical applications in several disciplines. In case of binary dependent variables, logit and probit models are most widely used, because of their realistic importance (Hoetker, 2007). The ordinary Logit model:

$$\ln \left[\frac{P(Y = 1 | X)}{1 - P(Y = 1 | X)} \right] = \alpha \sum_{i=1}^n \beta_i X_i + e \quad (1)$$

Where;

P(.) = Probability that consumer buys the chicken meat during the bird flu epidemic (Y).

α = Constant term.

X = A set of core explanatory variables.

β = A vector of unknown parameters.

e = Disturbance term.

The dependent variable of this model represents whether a consumer purchases chicken meat during the outbreak of bird flu or not. The characteristics and related variables assumed to be affecting the purchase of chicken meat are given here:

The independent variables; education, age and income are expected to negatively relate with the purchases of chicken meat during the outbreak of bird flu.

While, the family size is expected to positively relate with the purchases of chicken meat during the outbreak. For comprehensive analysis a dummy variable (DV) was used to isolate the impact of family size in relation to income on the demand of chicken during the widespread of bird flu. Two income groups were designed that is low income group and higher income group (Rs. 19000 per month). Similarly the model used to analyze the impact of bird flu on the demand of chicken meat is given below:

$$Y_i = \beta_0 + \beta_1 \text{Education} + \beta_2 \text{Age} + \beta_3 \text{Family Size} + \beta_4 \text{Income} + \beta_5 \text{DV} + \varepsilon_i$$

RESULTS AND DISCUSSION

The descriptive statistics for the variables used in the estimated logistic regression model for chicken demand are presented in Table 1. The basic descriptive statistics about the variables is indicated in Table 2. The decision to purchase or not to purchase chicken meat during avian influenza epidemic mainly influenced by education, age, family size and income of the consumers (Bolliger and Revirion, 2008). The estimated coefficients and the odds ratio of the logistic regression model are revealed in Table 3. Among these four variables, three variables were significant at 5 % level of significance except one (Education) and their signs were also as expected. The odds ratios shows the effects of individual independent variables of the possibility or chances to purchase the chicken meat during bird flu, other things being equal. The odds ratio is computed by exponentiating the parameter estimates for each explanatory variable. The ratio of the correct prediction is 80 per cent. The likelihood ratio test is significant at one percent level indicating the model has good explanatory power. The estimated Hosmer and Lemeshow's test p-value was 0.92, which is nonsignificant demonstrating that overall model was correctly specified.

The estimated odds ratio for education is

-0.98 which means as the education of a consumer increases by one year, there are 0.98 times fewer chances that the consumer will buy chicken during the bird flu. That is higher the education of the consumers less likely the consumer will buy the chicken meat during bird flu epidemic.

Table 1: Description of the Variables used in the Demand for Chicken Meat

Variable	Description
Dependent Variable (consumer demand of poultry meat)	1 if the consumer buys the chicken meat during the bird flu epidemic; 0 otherwise.
Factors included in the model as explanatory variables	
Education	Number of years school or college attended.
Age	Span of life in years.
Family size	Total number of family members of the consumer.
Income (000 Rs.)	Monthly income of the consumers (000 Rupees).
DV (Dummy Variable)	1 if the consumer belongs to a low income group; 0 otherwise.

Table 2: Descriptive Statistics of the Variables used in the Demand for Chicken Meat

Variable	Mini.	Maxi.	Mean	Standard Deviation
Education	0	16	6.90	4.62
Age	23	74	44.17	10.91
Family Size	2	9	5.72	1.58
Income	8	80	33.70	17.01
DV (Dummy Variable)	0	1	0.26	0.44

Table 3: The Coefficients and Odds Ratios of the Estimated Logistic Regression Model

Variable	Estimated Coefficients	Standard Error	Significance	Odds Ratio
Constant	3.82	1.813	0.035	45.77
Education	-0.022	0.063	0.729	-0.98
Age	-0.096	0.030	0.001	-0.91
Family size	0.368	0.177	0.037	1.45
Income	-0.042	0.023	0.070	-0.96
Dummy Variable	0.471	0.882	0.593	1.60

The Nagelkerk R² = 0.52 Pseudo R² = 0.35
 Likelihood Ratio Test = -44.58
 Hosmer Lemeshow Test = 3.22 Chi-square with 8 df (p = 0.920)
 Right predictions 80 percent

The odds ratio for consumers' age is -0.91 which indicates that as the age of the consumers' increase there are 0.91 times fewer chances that the consumers

will buy the chicken during the outbreak of avian flu. As the age of the consumers' increases they are gaining more and more maturity and learn over time the importance of contamination-free food that is why they avoid the purchase of chicken during the widespread of bird flu. The estimated odds ratio for family size is 1.45 which reveals that as the size of the family increases there are 1.45 times more chances that the consumers will buy the chicken during the wave of bird flu. The odds ratio for dummy variable is 1.60 which confirms that as the income of low families' increases by one thousand rupees those families likely to buy the chicken meat during bird flu by 1.60 times more. Hence this is true in case of low income families. The estimated odds ratio for consumers' income is -0.96 which explains that with the addition of each one thousand rupees in income there are 0.96 times fewer chances that the consumers will not buy the chicken meat during the widespread of bird flu (Diao, 2009; Tariq, 2008). It means that the consumers with very low income would like to buy the chicken during the flare-up of bird flu. It has been observed that the consumers of very low income group found the bird flu epidemic as a special opportunity to consume the chicken. During the outbreak of bird flu chicken prices were decreased to a very low level because of very low demand for chicken meat, consequently poor consumers bought the chicken meat in huge quantities.

CONCLUSION: The present study shows the implications of bird flu epidemic on consumption pattern of common household for chicken meat. This meat is considered to be a staple food and good substitute for high price mutton which has gone out of reach of a common consumer. Given socio economic variables were found having strong impact on consumption decisions of chicken meat during days of bird flu. An important finding of the research was the extra preferences of low income people for purchasing and consuming chicken meat during bird flu outbreak. Keeping in view detrimental effects of bird flu, this consumption pattern of poor and low income people seems alarming as this disease may have serious repercussions on them as well.

In this context, it is suggested that a uniform policy for controlling and discouraging consumption of chicken meat during bird flu epidemic, irrespective of income groups, may be framed.

REFERENCES

- Alam, S. M and A. H. Sheikh, Extending poultry farming to rural areas. *Economics and Business Review*. September 03, 2007. Daily Dawn, Pakistan. (2007).
- Bolliger, C. and S. Reviron, Consumer willingness to pay for Swiss chicken meat: An in-store survey to link stated and revealed buying behaviour. 12th congress of the European Association of Agricultural Economists, Ghent Belgium. (2008).
- Diao, X. Economy Wide Impact of Avian Flu in Ghana: A Dynamic CGE Model Analysis. Development, Strategy and Governance Division, International Food Policy Research Institute, Discussion paper 00866. (2009).
- Government of Pakistan. Pakistan Economic Survey. Economic Advisor's Wing, Ministry of Finance, Islamabad. (2009-10).
- Hoetker, G. The Use of Logit and Probit Models in strategic management research: Critical issues. *Strategic Management J.*, 28:331-343. (2007).
- Hosmer, D. W and S. Lemeshow. *Applied Logistic Regression*. Second Ed., John Wiley and Sons, Inc. New York. (2000).
- IRNA. Barbecued Chicken Still Popular Despite Bird Flu Scare. UN Office for Coordination of Humanitarians Affairs. Feb. 7, 2008, Karachi, Pakistan. (2008).
- Tariq, N. A Supply Chain and Network Analysis of Poultry Industry in District Faisalabad. M.Sc Thesis Department of Marketing and Agribusiness, University of Agriculture, Faisalabad. (2008).