ISSN 1682-8356
ansinet.org/ijps

INTERNATIONAL JOURNAL OF

POULTRY SCIENCE

ANSInet
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan
Mob: +92 300 3008585, Fax: +92 41 8815544
E-mail: editorijps@gmail.com

International Journal of Poultry Science 4 (5): 292-295, 2005
ISSN 1682-8356

2025 Vision for Mexican Chicken Consumption

Alejandro Salazar, Samarendu Mohanty and Jaime Malaga
Department of Agricultural and Applied Economics, Texas Tech University, USA
E-mail: sam.mohanty@ttu.edu

Abstract: This study estimates the demand for chicken meat for Mexico in 2025. Expenditure elasticities are calculated separately for ten income groups using national household survey data for the period 1984 to 2002. The results reveal that lower income groups will increase their chicken meat consumption in the future at a much higher rate than the upper income groups with the rise in income. Overall, the total chicken meat consumption is projected to increase by 70 percent in the next two decades. This translates into average annual growth of 3.5 percent which is much smaller than the current annual production growth of more than 8 percent. Based on these projections, it is very likely that Mexico will remain as either a small importer or self-sufficient in chicken meat in the future.

Key words: Mexican chicken, income groups, demand estimation

Introduction

Mexico is the fourth largest chicken meat producer in the world accounting for 4.3 percent of the world production in 2003. The total production in 2003 was 2.3 million metric tons, with a value of approximately 32 billion pesos (around 3 billion dollars). Even with average annual production growth of eight percent in the last decade, Mexico has emerged as one of the fastest growing chicken meat importer in the world with imports growing by more than 300 percent during the same period. Currently, Mexico also ranks as the fourth largest importer of chicken meat in the world. Since the implementation of North American Free Trade Agreement in 1994, per capita chicken consumption has increased by more than 50 percent (16.3 kilograms in 1994 to 25 kilograms in 2003) as compared to only 13 percent increase in per capita beef and pork consumption (32.5 kilograms in 1994 to 36.8 kilograms in 2003) (FAPRI, 2004). The afford ability of chicken to the other meats and increased consumer awareness of cholesterol problems from red meat consumption have been primarily responsible for the expansion of the chicken consumption at the expense of beef and pork (FAS, 2004). Consumers continue to prefer fresh whole chicken to chicken parts although the purchase of chicken parts is increasing slowly in supermarkets servicing higher income groups.

Within Mexico, per capita chicken consumption varies significantly among income groups with the wealthiest 10 percent (decile 10) consuming three times more than the poorest 10 percent (decile one) of the population (Fig. 1). In addition, consumption growth within each income group has varied significantly over the years. For example, between the periods 1984 to 2002, per capita chicken consumption for decile one has increased by more than 880 percent as compared to 480 percent for decile four and 250 percent for docile 10. The North American Free Trade Agreement (NAFTA) implemented in 1994 has definitely contributed to the consumption increase by lowering tariffs on chicken meat imports into Mexico from its NAFTA partners (United States and Canada).

As the income grows in the future, lower decile consumers are likely to allocate higher proportion of their income for food as compared to the upper decile consumers. In addition to the varying food expenditure growth, consumption response of the lower income groups will be much greater compared to the upper income groups with the rise in purchasing power. In an similar study, Mohanty and Rejendran (2003) estimated future growth in Indian poultry consumption taking into account urbanization and varying consumption behavior across different income groups. The results indicated that per capita egg and poultry meat consumption of lower income groups both in the urban and rural areas are likely to grow at a much faster pace than the upper income groups. Interestingly, rural per capita poultry meat consumption for all income groups, which are substantially lower than their urban counterparts, is likely to grow at a higher rate and approach closer to the urban per capita consumption by 2020.

This study attempts to measure the future growth in Mexican poultry meat consumption by taking into account varying consumption behavior across different income groups. The remainder of the paper is organized as follows. The next section describes the model

Table 1: Annual Food Expenditures by Income Groups (in Pesos)

Decile	1	2	3	4	5	6	7	8	9	10
Per Capita Food Exp.	1,665	2,590	3,153	4,133	4,794	5,416	6,041	7,024	8,066	11,645
Income Share on Food	49.8	44.3	40.2	37.2	35.1	32.3	29.1	26.5	21.9	13.9

Table 2: Parameter Estimates for Log Quadratic Model for Chicken consumption

Variable	Parameter Estimate	Pr > |t|
Intercept	-34.31128	0.0006
Log (expenditure)	7.80610	0.0011
Log (expenditure)^2	-0.41291	0.0035
NAFTA (dummy)	1.00258	<.0001

specification. This is followed by a description of the data and the estimation procedure. The final section of the paper discusses the results and highlights the policy implications of the study.

Materials and Methods

Modeling Framework: There are two primary ways to determine the projected demand for food grains and other consumption necessities (Brahmananda, 1997). The first approach is to postulate a different value of the growth rate of real national income and then calculate the growth rate of demand for food commodities on the basis of estimates of income elasticity of demand for agricultural commodities. The second approach is to project alternative values for the growth rate of employment and then derive the growth rate of agricultural commodities on the basis of employment elasticity of demand for agricultural commodities.

In this study, income elasticity approach is used to estimate urban and rural demand projections. Separate demand projections are justified because of significant variations in food consumption between rural and urban areas and the rapid growth in urban population in the next few decades. In addition, consumption level also varies significantly across different income classes within each category. In order to capture the varying income responses on consumption, demand projections are made separately for five income groups within each category.

A large number of alternative functional forms are possible for modeling the Engle curve, which is the relationship between food demand and income levels. Double-log specification has been used widely because of its simplicity and readily interpretable properties.

Double Log: $Ln(Y) = a + b*Ln(X)$, (1)

where Y is the quantity consumed and X is the income level.

Income Elasticity = b

However this functional form is not theoretically desirable given its limitation that all food consumption is expected to increase with rising income levels. Other functional forms include semi-log, log inverse, and log-quadratic specifications.

Semi-Log: $Y = a + b*ln(X)$ (2)

Income Elasticity = b/Y

Log inverse: $Ln(Y) = a + b/X + c*ln(X)$ (3)

Income Elasticity = b/X-c

Log Quadratic: $Ln(Y) = a + b*ln(X) + c* ln(X)^2$ (4)

Income Elasticity = $b + 2*c*ln(X)$

Data and estimation: Data for estimating demand equations were collected from the National Household Income-Expenditure Survey conducted by the Mexican National Institute of Geography Statistics and Informatics. Average per capita chicken meat consumption, food expenditures and income for each of the ten deciles were collected for the years 1984, 1989, 1992, 1994, 1996 and 2002. As shown in Table 1, per capita food expenditure for decile one was 6,165 pesos in 2002 as compared to 11,625 for the decile ten. For decile one, the food expenditure accounted for 49.6 percent of the total income whereas for decile ten, it accounted for only 13.9 percent of their income.

Three alternative functional forms (equation 2 to 4) of the Engle curve were estimated. A dummy variable was included in the demand equation to account for NAFTA and health awareness on poultry meat consumption since 1996. All three specifications provide good fit. But the log-quadratic functional form appears to perform better than the other two functional forms. Parameter estimates of the log-quadratic functional form are shown in Table 2. All the variables are found to be highly significant at 5 percent or higher significance level. Food expenditure elasticities for all the income groups are reported in Table 2. As expected, the expenditure elasticities for poultry meat are found to be higher for lower income groups. For example, the poultry meat expenditure elasticity for decile one is estimated to be 1.65 as compared to 0.18 for decile ten. These findings are similar to those of Mohanty and Rajendran (2003) who estimated income elasticities for chicken meat for various income groups in India.

Table 3: Expenditure Elasticities for Chicken Meat by Income Groups

Decile	1	2	3	4	5	6	7	8	9	10
Elasticity	1.65	1.32	1.17	0.97	0.86	0.76	0.68	0.57	0.46	0.18

Results and Discussion

In this section, the methods followed to project Mexican poultry consumption for 2025 are discussed. Demand projections depend upon assumptions about various exogenous variables such as population growth and real GDP projections. Income projections for Mexico were collected from the Energy Information Administration and population projections were obtained from the United Nations. The following macroeconomic assumptions were incorporated in the simulation model.

a) Population is projected to grow on an average year rate of 1.4% during the period 2003-2005; 1.27 percent in 2006-2010; 1.09 percent in 2011-2015; 0.91 percent in 2016-2020 and 0.74 in 2021-2025.
b) Real GDP is expected to grow an average year rate of 3.57 percent in the period 2006-2010; 3.82 percent in 2011-2015; 4.32 percent in 2016-2020; and 5.01 percent for 2021-2025. With increasing GDP growth and decreasing population growth, per-capita GDP growth is expected to grow at an average year rate of 2.27 in 2006-2010, 2.70 percent in 2011-2015, 3.37 percent in 2016-2020 and 4.24 percent in 2021-2025.

Generally, expenditure growth is assumed to be the same as GDP growth. However, GDP includes more than just private consumption, i.e., private investments, imports, exports, and government spending. Thus it is likely that food expenditures will follow private consumption more closely than general economic indicators such as GDP. A recent study by Lutz and Smallwood (1997) supports this by finding that in the United States food spending tends to more closely follow private consumption than GDP. Keeping this in mind, in this study, consumption expenditure growth is calculated from private consumption rather than GDP. Further inequality in income distribution is introduced in ten income groups (decile 1 to 10) by assuming that upper income groups will have a greater share of income growth.

As expected, chicken consumption in the lower income groups are projected to grow at a much faster rate than the upper income groups as the income rises in the future. For example, per capita poultry meat consumption for the decile one is projected to double in the next twenty years increasing from 8.58 kg in 2002 to 16.8 kg in 2025. Similarly, the consumption in decile 4 is likely to grow from 18.92 kg in 2002 to 27.1 kg in 2025.

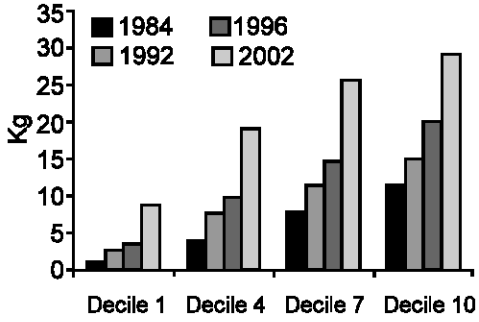

Fig. 1: Per Capita Chicken Consumption by Income Groups (1984-2002)

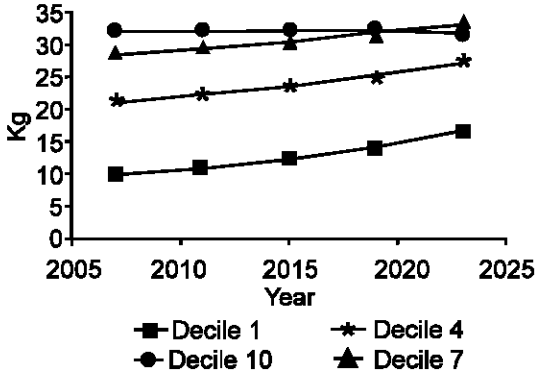

Fig. 2: Projected Per capita Chicken Consumption for different income groups

Unlike the lower income groups, the wealthiest consumers (decile 10) are not expected to consume more chicken meat in the future as the income rises. This is because the level of consumption in this decile is already high (29.08 kg in 2002) which is very similar to the average U.S. consumption. However, chicken consumption of the upper deciles (5 to 9) is expected to grow at a much slower rate. For example, the per capita consumption of decile seven is projected to grow from 25.6 kg in 2002 to 33.2 in 2025.

As shown in the Fig. 3, total domestic consumption is projected to increase by more than 64 percent in the next two decades increasing from 2.39 million metric tons (mmt) in 2002 to close to 3.9 mmt in 2025. If Mexican chicken meat production continues to grow at an average historical annual growth rate of seven percent then Mexico will become a net exporter of chicken meat in the next few years.

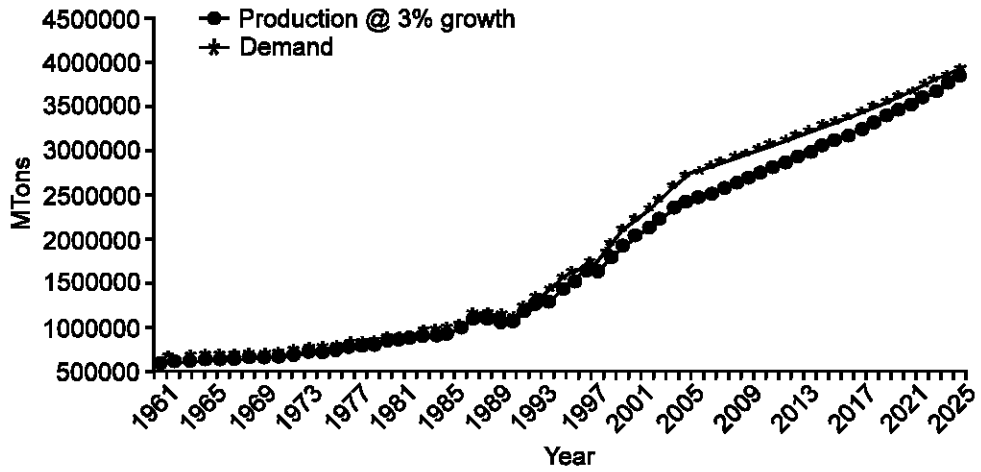

Fig. 3: Supply and Demand Projections for 2025

Summary and concluding remarks: The study projects chicken meat consumption in Mexico for 2025 by taking into account the difference in consumption pattern across income groups. The findings reveal a relatively strong growth of chicken meat in the next two decades. The average per capita consumption is projected to grow from 23.9 kilograms in 2002 to 29.4 kilograms in 2025. It is also found that per capita consumption of lower income groups are likely to grow at a much faster pace that the upper income groups. Interestingly, per capita consumption of upper income groups (deciles 5 to 10) is projected to converge around 32-33 kilograms by the end the projection periods.

Overall, the study reports that total chicken meat consumption is projected to increase by 64 percent from 2.38 mmt in 2002 to 3.9 mmt in 2025. Annual production growth of 3-4 percent would be sufficient to meet the demand making Mexico self-sufficient in chicken meat. The required production growth of 3-4 percent is much smaller than the 8 percent annual growth witnessed in the last decade. If Mexican chicken meat consumption continues to grow at the current rate then it is very likely that Mexico will become a growing exporter of chicken meat in the future.

References

Brahmananda, P.R., 1997. 50 Years of Free Indian Economy. New Delhi: Indian Economic Association Trust for Research and Development.

Food and Agricultural Policy Research Institute, 2004. FAPRI 2004 U.S. and World Agricultural Outlook. CARD Staff Report 1-04, Iowa State University.

Foreign Agricultural Service, USDA., 2004. Attache Reports. (can be accessed online at http://www.fas.usda.gov/scriptsw/attacherep/default.asp}

Lutz, S.M. and D.M. Smallwood, 1997. Food Spending Moderates in a Growing Economy. Food Rev., 20: 20-25.

Mohanty, S. and K. Rajendran, 2003. 2020 Vision for Indian Poultry Industry. Int. J. Poult. Sci., 2: 139-43.