EXPORT PERFORMANCE OF POULTRY PRODUCTS IN INDIA

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Abstract: The study explores the export performance of poultry products in India for during the period 1997-97 to 2015-16 (20 years). The objective of the study was to analyse the growth rates, instability and trends of the poultry products in India. The secondary time series data for the last 20 years was equally divided into three periods i.e., period I (1997 to 2006), period II (2007-2016) and overall period (1997-2016). The collected data were analysed with the help of statistical tools like CGR, CV, Cuddy-Della Instability Index and trend analysis in order to fulfil the objective of the study. The study indicate that, the compound growth rate of production of both poultry products was highest in period I (10.64 per cent per annum & 6.63 per cent per annum). Similar results were found in export quantity as well as unit value of export of poultry products i.e., period I (92.56 per cent per annum, 36.72 per cent per annum). Cuddy-Della instability index for production (Chicken meat and eggs), export quantity and export value of poultry products was found to be high in the first period and low in second period i.e. period II (1.43, 1.99, 25.67 and 18.20 respectively) but unit value of export was found to be high in the second period i.e. period II and low in first period (7.39). There was stability in the production, quantity exported and export value of poultry products during period II compared to period I as indicated by lower coefficient of variation in period II. There was increase in trend in production, export quantity and export value of poultry products during overall period was positive and cubic model was found best fitted based on R² and significance of coefficients.

Thus, the study concluded that the poultry products have better export potential in future. Hence, it is suggested that to achieve the breakthrough in poultry products export, there is need to initiate a systematic and long term export planning at the national levels.

Key words: Export, Export performance, Poultry Products.

Introduction

Poultry is one of the fastest growing segments of the agricultural sector in India. The production of eggs and broilers has been rising at a rate of 8 to 10 per cent per annum. Indian Poultry Industry is booming and emerging as the world's second largest market. The growth rate is growing at the phenomenal rate of 12 to 15 per cent every year. The potential in the sector is due to a combination of factors – growth in per capita income, a growing urban population, use of modern techniques, changing from live bird to fresh chilled and frozen product market and falling real poultry prices. India, the world's second largest developing country, is experiencing rapid growth in poultry sector.

The total egg production has increased from 27.33 Billion during 2015-16 (Rainy) to 29.09 Billion during 2016-17 (Rainy) registering a growth 6.42 per cent. As against the targeted production of

87.05 Billions of eggs during 2016-17, the total estimated production in two seasons, summer and rainy, is 55.11 Billion showing an achievement of 63.31 per cent. The production of egg is largely contributed by commercial poultry farms with nearly 75.75 per cent and remaining production is from household/backyard poultry. The first five highest eggs producing States are Tamil Nadu, Andhra Pradesh, Telangana, West-Bengal & Haryana during the Rainy Season. The total meat production has increased from 2.24 million tonnes during 2015-16 (Rainy) to 2.43 million tonnes during 2016-17 (Rainy) registering a growth 8.74 per cent. As against the targeted production of 7.37 million tonnes during 2016-17, the total estimated production in two seasons, summer and rainy, is 4.67 million tonnes showing an achievement of 63.28 per cent. Nearly, 47.86 per cent of the meat production is contributed by poultry and 20.11 per

cent is from buffaloes. The first five highest Meat producing States are Uttar Pradesh, Maharashtra, West Bengal, Andhra Pradesh, & Telangana during the Rainy Season. Therefore with a view to analyze India's export performance of natural honey the present study was under taken with the specific objectives (1)To measure growth in export of poultry products. (2) To estimate the instability in export of poultry products. (3) To analyze the trends in export of poultry products.

Methodology

Selection of Period

Based on the objectives the data regarding production, export quantity and export value of poultry products in India were collected from 1997-98 to 2015-16, which include 20 years data. The period has been divided into three periods,

Period I (1997-98 to 2005-06)

Period II (2007-08 to 2015-16)

Overall period (1997-98 to 2015-16)

Nature and Source of data

The nature of data used for the study was entirely based on secondary source of data. The secondary data was collected on volume of trade from the official website of FAO.

Analytical tools and techniques

The data was collected from secondary source subjected to appropriate analytical techniques in order to arrive at a meaningful conclusion. The different analytical technique used for the study were - Growth rate analysis, Instability analysis and Trend analysis.

Estimation of Growth Rates

The first objective of the present study is to estimate the growth in production and export of poultry products in India.

The growth rates in production and export of poultry products in India was studied by using compound growth rates.

The growth rate was estimated by using following model

$$Y = a.t^b \quad .... (1)$$

Where,

Y = Depended variable for which growth rate is to be estimated

(Quantity exported / export value / unit value)

a = Intercept

b = Regression Coefficient

t = Time Variable

This equation was estimated after transforming (1) as follows,

$$\text{Log } y = \log a + t \text{ Log } b \quad .... (2)$$

Then the percent annual compound growth rate (g) was computed by using the relationship.

$$CGR = [\text{Antilog } (\log b) – 1] \times 100 \quad ….…............ (3)$$

The significance of the regression coefficient was tested using the student's t' test.

Degree of instability in production and export of natural honey

In order to study the instability in the export of poultry products, the Coefficient of variation and Cuddy Della Valle instability index was used.

- ### Coefficient of variation (CV)

Coefficient of variation (CV) $= \frac{\sigma}{x} \times 100$

Where,

σ = Standard deviation

$$S = \sqrt{\frac{\sum (X - \bar{X})^2}{n}}$$

$\bar{X}$ = Arithmetic mean

X = Variable

n = Number of observation

- ### Cuddy Della Valle's Instability Indices (CDVI)

It was used to measure instability in export of poultry products which was close to approximation of the average year to year percent variation adjusted for trend. The algebraic form of it was;

$$\textbf{Instability Index} = \textbf{CV}\sqrt{(1 - R^2)}$$

Where,

CV = Simple Estimates of coefficient of variation in per cent and

R^2 = Coefficient of determination from a time trend regression adjusted by the number of degree of freedom.

Trend Analysis

The trend in production, export quantity and export value of poultry products was computed for the series data of 1996-97 to 2016-17. To trace the path suitable function was used.

Result and Discussion

Keeping in view the objectives of the study, the necessary data collected from different sources were analysed and interpreted. The results obtained are presented and discussed below.

Growth rates in production and export of poultry products

The exponential growth function used for estimation of compound growth rates in production, export quantity, export value and export unit value of poultry products are presented in the following table. The export performance of poultry products from India with respect to production, export quantity, export value and export unit value was evaluated for the period I (1997-2006), period II (2007-2016) and overall period (1997-2016) and the results are presented in the table 1.

Table 1: Period-wise Compound growth rates of production, export quantity, export values and export unit value of Poultry Products (1997-2016)

	Production		Export Quantity	Export Value	Unit Value
	Eggs	Chicken Meat			
Period I(1997-2006)					
CGR	6.63**	10.64**	92.56**	24.25**	54.97**
x-variable	0.03	0.04	0.28	0.09	0.19
t value	14.32	34.50	6.28	6.85	4.97
R square	0.96	0.99	0.83	0.85	0.76
Period II(2007-2016)					
CGR	4.97**	7.90**	-9.70	6.56*	-15.26**
x-variable	0.02	0.03	-0.04	0.03	-0.07
t value	34.94	29.69	-3.75	3.05	-7.95
R Square	0.99	0.99	0.64	0.54	0.89
Overall Period(1997-2016)					
CGR	5.61**	9.54**	27.57**	13.99**	11.90*
x-variable	0.02	0.04	0.11	0.06	0.05
t value	37.59	51.54	4.74	10.29	2.71
R square	0.99	0.99	0.55	0.85	0.29

Note: **- denote significant at 1 % level and *-- denote significant at 5 % level

Table 1 reveals that in period I production (egg and chicken meat), export quantity, export value and unit value realized through exports have growth rate 6.63 per cent per annum, 10.643 per cent per annum, 92.56 per cent per annum, 24.25 per cent per annum and 54.97472 per cent per annum, respectively and were found to be statistically significant at one per cent level of significance.

In the period II he production, export quantity, export value and unit value of export going significantly at the rate of 4.974 per cent per annum, 7.90 per cent per annum, -9.70 per cent per annum, 6.56 per cent per annum and -15.26 per cent per annum respectively.

The overall 20 years growth rate of export quantity of poultry products in India was highly significant at 27.571 per cent per annum and much higher than the growth rate of production and export value of poultry product for overall period was 5.613 per cent per annum, 9.545 per cent per annum and 13.99 per cent per annum, respectively and significant at one per cent level while the growth rate of unit value of poultry product was 11.904 per cent per annum significant at five per cent level.

The export of poultry product has shown positive and significant growth trend for period I and overall period for production, export quantity, export value and unit value of export, while it showed

negative growth trend for export quantity and unit value of export for period II with other values being positive.

Instability in production and export of poultry products

There should not be obviousness regarding instability by considering the growth rates as growth rates will only explain the growth rate over the period, while the instability will judge the stability of growth performance for period for the pertinent variable. Therefore for better understanding of magnitude and pattern of changes in the level of production, export and unit value of poultry products in India instability analysis is done. The simple coefficient of the variation (CV) often contains the trend component and hence overtimes the level of instability in the time series data characterized by long term trend. So as to overcome this problem, the study of instability index given by Cuddy Della Valle (1978), which corrects the coefficient of variation was used.

Table 2: Instability of production, export of Poultry Products (1997-2016)

	Production		Export Quantity	Export Value	Unit Value
	Egg	Chicken Meat			
Period I(1997-2006)					
Mean	2145300	1040260	345812.71	16722.79	12.63
SD	416209.89	310597.70	473419.30	10725.37	15.29
CV	19.40	29.86	136.90	64.13	12.63
CDVI	3.45	2.86	56.23	24.47	7.39
Period II(2007-2016)					
Mean	365762.50	2564034	725027.80	50192.57	15.81
SD	543970.38	577514.60	308996	13430.55	8.73
CV	14.88	22.52	42.62	26.75	55.22
CDVI	1.98	1.43	25.67	18.19	21.73
Overall Period(1997-2016)					
Mean	2900031.30	1802147	539983.21	32426.82	14.22
SD	906543.33	902609.90	446439.50	20891.30	12.23
CV	31.26	50.08	82.67	64.43	85.95
CDVI	3.32	7.48	55.13	24.56	84.18

Table 2 reveals that the egg production exhibited less variability with co-efficient of variation at 19.4 per cent and 14.9 per cent in period I and period II, while it was highest in overall period with coefficient at 31.5 per cent. Even the chicken meat production exhibited less variability with co-efficient of variation at29.9 per cent and 22.5 per cent in period I and period II and overall period being highest with co-efficient 31.5 per cent.

As regard with the quantity of poultry products exported, the highest variation was observed 136.9 per cent in period I with co-efficient of variation at 42.6 per cent and 82.7 per cent in period II and overall period respectively.

Export earnings in terms of value showed very less variation with co-efficient of variation 64.1 per cent and 64.4 per cent in period I and overall period while high variation was observed in period II with co-efficient of variation at 26.8 per cent. However, the instability observed in unit value of poultry products was observed highest variation in overall period with co-efficient of variation at 86 per cent and 12.6 per cent and 55.2 per cent in period I and period II respectively.

Cuddy-Della instability index for production, export quantity and export value was found to be high in the first period and low in the second period but in case of unit value of export it was observed that second period was high than first period, on the whole it was observed that the degree of stability decreases for production, export quantity and export value for second period while the degree of stability increases for unit value of export for second period.

Trend in production and export of poultry products

The trend equations were fitted to assess the production, export quantity and export value. Depending upon its better fit, was analyzed by the production functions viz., linear, logarithmic, inverse, quadratic, cubic, compound, power, s, growth, exponential, logistic the trend and the results are assessed and presented under different categories namely trends in production, export quantity and export value.

Knowing the above overall performance, path of movement of the series was traced through parametric trend model (Table 3). A wide range of models has been explored, among the competitive models best fitted models are selected based on the R^2 along with significance of coefficients.

Table 3: Trend in production and export of Poultry products

Sr. No	Particulars	Function	R^2	Coefficients		
				b1	b2	b3
1	Egg Production	Cubic	0.99	159351**	-4141.74	204.89*
	Chicken Meat Production	Cubic	0.99	31206.78	7762.96**	-111.10
2	Export Quantity	Cubic	0.59	169477.80	-3059.93	-182.03
3	Export value	Cubic	0.89	1648.70	172.82**	-4.98

Among the competitive parametric models, all cases cubic models are found best fitted for production, export quantity and export value, thereby indicating that the movement of all the series was uniform throughout the India.

Coefficient b_1 was significant at one per cent level only for egg production other being non-significant while coefficient b_2 was significant at one per cent level for chicken meat and export value, egg production and export quantity being non-significant whereas coefficient b_3 was significant at 5 per cent level only for egg production while others being non-significant.

Conclusion

The present study was undertaken to analyse the compound growth rates, during the study periods have shown positive and significant value indicating vast potential for the export of poultry products from India. Hence there is need to evolve policies directing higher production of broilers and formulate alternative management strategies and policies to boost egg export in India. While the trend analysis showed that only production and export value of poultry products were found to be significant which may be due to the changes in policies and its execution at different periods of time.

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