

## Evaluating factors that influence egg production at Konsoni Poultry Company

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**Abstract:** The main focus of this research is to evaluate the factors thought to influence the monthly egg production of Konsoni Poultry Company. The linear regression employing different variables of interest is used to predict the future monthly egg production of the largest poultry farm in Kosovo. The general purpose of multiple regressions (the term was first used by Pearson, 1908) is to learn more about the relationship between egg price, local competitors and egg imports as independent or predictor variables ( $x_i$ ) and dependent or criterion variable, egg production ( $y$ ).

$$Y = B_0 + B_1 * X_1 + B_2 * X_2 + \dots + B_n * X_n$$

The results of the research come from the observed fluctuations in egg production at Konsoni Poultry Company during the period of 24 months. Many factors that effect egg production are poorly understood from managers of Konsoni Poultry Company. This study examines the statistical results and identifies the relationships between depended and independent variables. The study shows that there is a strong relationship between depend variably ( $y$ ) and independent variables ( $x_i$ ). and low correlations among independent variables The adjusted  $R^2$  of the multiple linear regression model is 0.48 which tells us that 48% of variation in egg production are explained by evaluated variables.

Konsoni Poultry Company covers 20% of the market share for eggs in Kosovo. In general, multiple regression is used to answer the general question what is the best predictor of Konsoni egg production.

### Introduction

Since the 1999 conflict, the poultry industry has made rapid rehabilitation and with that significant contribution to Kosova's agricultural economy. In late 1999 Kosovar egg industry started with 250,000 layers covering only 30% of annual needs. The egg laying industry in 2007-08 has reached the peak of production with 900,000 layers producing 275,000,000 eggs or 100% of Kosovo annual egg needs, and in times needing to unload the surplus in markets of neighboring countries such: Serbia, Macedonia, and Albania.

At present Kosovar egg industry counts 143 commercial farmers that have from 1,000 to 165,000 layers in production. Konsoni Poultry Company are the largest poultry company in Kosovo .

Koni was a privately owned business that started its operation in 1992 as an egg trader. Initially, Koni started its egg trade by supplying eggs to groceries and other traders but, later started opening his own selling points first in Pristina and later Kosovo wide. Koni was purchasing eggs from local producers but was also importing them from European countries. During all this time Koni was facing one big problem of not being able to keep the steady supply of always fresh eggs so there were times when eggs needed to be destroyed due to improper transport and storage. In 2001 Koni rented one farm placing 25,000 layers which they kept until mid 2002, unfortunately they lacked production knowledge so they were facing difficulties with production .Soni was a privately owned commercial poultry farm that has started its operation in 1998 with the capacity of 10,000 egg layers producing 3,000,000 eggs annually or 2% of the Kosovo egg consumption. Soni was mainly focused in supplying

eggs to traders and groceries. Unfortunately, due to instability of the market and large imports of eggs from regional countries Soni was facing difficulties in with his plans of expanding his business.

In 2002 Koni & Soni have signed a partnership agreement for joining their production and sales activities with aim to become the market leaders in poultry industry in Kosovo (Konsoni Company). Initially, Koni & Soni rented the SOE in Gjakova where they placed 150,000 layers in production and later they rented another SOE in Gjilan where they raise pullets for replacement and for the market. Two companies operate from three different business centers. The poultry farms are located in Gjakova and Gjilan while the trading activities lead from Prishtina. The main activities of Koni & Soni include production of consumer eggs, animal feed, replacement pullets and lately broilers (poultry meat). Starting as companies with 3 employees each, it has now grown to an esteemed, contemporary company with over 120 employees. The group has privatized the modern farms in Gjilan which they rented in 2003 and has also privatized the farms in Gjakova which they were renting since 2002. A solid proof for the quality of Koni & Soni's eggs is provided by its customers all over the country. Through its modern established sales network of over 25 shops and discount stores the company is continuously endeavouring to make the products more approachable to the end users. Presently Koni & Soni operates only in the Kosovo market and its market share is estimated to around 20% of the whole egg market in Kosovo. The purpose of the research was to confirm the hypothesis that the selected parameters are correlated with egg production.

### Material and the working method

In order to determine the role of parameters that have an impact on the profitability and the sustainability of Konsoni Poultry Company, a Regression Analysis statistical package is used (Cliff T. Ragsdale, 2001). The biggest problem in estimating a model was in determining which variables should be in the model. That is, what are those variables that explain the variation in the dependent variable. We started out with what we believed to be the best model given the data that we were able to obtain to examine the model for logical soundness after estimation. After sampling numerous independent variables, those that contained the correct signs and proved to be statistically significant were retained in the model. Through regression analyses we have identified the factors that influence the egg production of Konsoni Poultry Company. This statistical program is used as a tool to statistically confirm the correlation between egg production and the above mentioned parameters which are the main factors that have an impact on the profitability and the sustainability of Kony sony poultry farm. The multiple linear regression model was used to evaluate the impact of independent variables as to possible effect on the egg production which in multiple linear regression model is presented as a dependent variable, whilst all other parameters were considered as fixed variables.

### Results

The statistics of the regression model: the root mean square error (RMSE), coefficient variation (CV), the average of the dependent variable (egg production), standard deviation (Std DEV) R square, adjusted R

square, intercept and other coefficients are presented in Table 1 and Table 2.

According to the results of regression analyses there is a direct correlation between the dependent variable intercept egg production and the price coefficient which means that when egg price is increased the egg production is increased as well. In this study the one euro increase in price of eggs per box will increase the egg production for 117 boxes. Selling price of eggs is definitely a factor that has an impact on the increase of egg production. This is explained with the fact that the P value is below 0.05. This means that we are between 95% and 99% confident that egg selling price has an impact on the egg production. Whilst the correlation between the local egg competitors and the egg production is indirect which means that for one box of eggs produced from local egg competitors the egg production from Konsoni Poultry Company farm will decline on average by 0.3 boxes of eggs the significance level of this coefficient lies between 90% and 95% The correlation between the dependent variable intercept egg production and the coefficient of the egg imports is indirect, which means that when egg imports is increased the egg production is decreased. In this study on average 0.4 egg boxes will be produced less from Konsoni Poultry Company, for each imported box of eggs. The P value shows that we are 86% confident of the results of this coefficient. The standard error (RMSE), in the regression model shows the unexplained variability around the regression line, the true random variability after the effect of independent variables has been removed. The RSME is much smaller than standard deviation of sample size. Adjusted R square shows the proportion of total variability in

egg production explained by the regression model, which means that 48% of the changes in egg production are caused by the analyzed

parameters. The statistics of the multiple regression model tell us that regression model is better than reference model.

Table 1. Multiple linear regression statistics for Koni Soni poultry farm egg production as a function of three variables using linear functional form

Variable or Statistics	Functional form	
	Linear	
	Estimated Coefficient	P - value
Intercept	24,931	0.011
Selling Price/egg	117	0.003
Loc Competition	-0.3	0.072
Import Egg/month	-0.4	0.139

Note: egg production depended variable

Table 2. Regression model statistics

Dependent variable mean	11842
Dependent variable standard deviation	1105
Standard Error of the Estimate (RMSE)	795
Coefficient of Variation (CV)	0.07
R-Squared	0.55
Adjusted R-Squared	0.48
F -statistics	0.00
No. of Observations	24

## Discussions

The poultry sector is important since it supplies the citizens of Kosovo with fresh eggs at reasonable prices. Poultry production has long been recognized as one of the quickest ways for a rapid increase in protein supply in the shortest run (S.A. Yusuf and O. Malomo, 2007). One of the current challenges for commercial poultry farmers in Kosovo is how to reduce the costs with egg production efficiency. Eggs are homogeneous products, consumers are more willing to switch from one brand to another when product is homogeneous and tend to be less loyal because any brand of eggs will meet their needs (D. Besanko, D. Dranove et al, 2003). The sale of eggs depends on their

price, size and freshness. Supplying markets with fresh eggs is essential to increase the demand for the Konsoni eggs that consumers are willing to buy. Good relationship between Konsoni suppliers and retailers is essential in improving the competitiveness of the egg production.

Avoiding possible problems, communication links must be established and utilized on regular basis, to improve the competitiveness a trusting relationship with partners in the egg supply chain must be developed (Robert B. Handfield, Ernest Nichols, jr, 1999).

The results presented lead us to conclude that Konsoni Poultry Company has the potential to follow the market trends and by increasing egg production gain more market share.

### Conclusions

The price of eggs has the highest impact on the profitability of Konsoni Poultry Company. Therefore, the managers must take responsibility to improve the production efficiency and compete with imports, and local competitors. It is essential for Konsoni Poultry Company to fully understand the egg market structure in Kosovo, and be able to evaluate if the market is working efficiently and whether Konsoni is getting an acceptable share of the Kosovo egg market. Konsoni will improve the profit and gain more market share by making sure to produce fresh and appropriate size eggs while keeping the costs as

low as possible; consumers are assumed to buy a product up to the point where the perceived value of the product equals the price of the product (Ronald A. Schrimper 2001) . This study points out to Konsoni the opportunities for a proper approach in the future to avoid factors that contribute to lower competitiveness of local egg production thereby gaining the trust of consumers.

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