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**The California Situation:
A Special Report**

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Compiled by Maro Ibarburu

Associate Scientist - Business Analyst

Iowa State University

maro@iastate.edu

Phone (515) 294-8132

INTRODUCTION

January 1, 2015 will change the U.S. shell egg industry. Depending on your source, egg prices are quoted as jumping 10-40 percent for California consumers. As egg supply and demand curves fluctuate, so will the egg prices. This report shares some thoughts about the California market situation considering the cost of complying with the new space requirement. It also outlines the outcomes of various customer choices in the marketplace. An attempt was also made to explain some of the unknowns that have been frustrating egg market economists as the compliance date looms ahead.

BACKGROUND

The California Shell Egg Food Safety Rule requires, among other things, a minimum of 116 in² per layer to produce eggs compliant for sale in California. This new space represents an increase of approximately 73 percent with respect to conventional housing systems. While there are various ways to achieve these requirements, all of them lead to a higher cost of production than it takes to produce table eggs in the conventional system.

The multi-stakeholder group called the Coalition for Sustainable Egg Supply (CSES) commissioned a two-flock, commercial-scale study on layer housing in the US. The Interim Findings Report from that study indicates the cost of producing enriched colony eggs at 116 in²/layer to be approximately 15 percent higher than conventional costs. While calculations by different researchers may vary from this number, for the purposes of this report 15 percent is used when needed for predictive equations.

Two scenarios, as listed below, best summarize the reason for the increased cost of producing a dozen eggs.

INVEST	DON'T INVEST
Under this option the producer decides to build new hen houses to add this new space to the existing housing capacity of the farm. This would allow him/her to keep a similar number of layers for the farm.	Under this option the producer decides to downsize the number of hens in the houses to meet the new space requirement. Therefore the operation will have a lower production for the farm, and the fixed costs such as the grading machine, investment in land, roads, etc. are diluted in less eggs, thus increasing the fixed cost per dozen eggs produced.

ANALYSIS OF A POTENTIAL MARKET EQUILIBRIUM

In an equilibrium market situation, the price paid to producers would rise in direct proportion to the cost of production. When this doesn't occur, two additional scenarios arise:

Premium Higher than Extra Cost	Premium Lower than Extra Cost
If producers get paid more than the extra cost needed for the operation, egg producers have an additional incentive to invest in becoming CA compliant. This will increase the overall supply of eggs coming into the CA market and it will eventually result in lower prices.	If producers get paid less than the extra cost needed for the operation, some producers who have invested in becoming CA compliant could see an incentive to leave that market. Such movement would decrease the egg supply in CA resulting in higher prices in CA and increase the supply in the rest of the US.

In the short run we will likely experience all sorts of variations as the market tries to find the new equilibrium. For example, a leading hen-laying equipment manufacturer in the U.S. stated the California supply is projected to be short of 2 to 3 million layers at the beginning of 2015. This shortage would correspond to a 28% to 42% higher price per the EIC projection model. Therefore in the short run we may expect much bigger premiums for CA compliant eggs. Even after the new equilibrium has been reached, there will be some natural fluctuations of prices as the quantities of eggs supplied and consumed change.

THE PRICE OF EGGS

The EIC's egg price projection model estimates that a one percent decrease in the number of eggs produced will result in a five percent increase in egg price. Therefore in order for the egg prices to reach equilibrium with the cost of production, the CA total egg supply would need to be three percent lower than any typical year (15/5).

If we assume that Californians consume the same number of eggs per capita per year as the rest of the country (261), we can estimate that the projected 38.8 million people living in California in 2015 would consume 10,127 million eggs in 2015. Therefore a three percent decrease in egg supply would represent approximately 304 million fewer eggs available in California. This is equivalent to the production of 1,062 thousand layers (at 286.2 eggs per layer per year).

THE IMPACT OF HIGHER COP OR EGG PRICE ON A FAMILY OF FOUR

One common question is, “How will this cost or price increase impact a family of four?” If we assume that the retail price will increase 15 percent from the last five-year average of \$1.77/dozen, this would represent an increase of 26.55 cents/dozen. The annual per-capita egg consumption in the US averages 261 eggs, but 31 percent of the consumed eggs are in the form of processed eggs, which are already pasteurized. Since pasteurized eggs are not covered by the shell egg safety rule, the increase in cost will only apply to the 180 shell eggs consumed (261 eggs × 69%), or 15 dozen eggs per person.

The annual increased cost or expense of eggs per consumer then would be estimated to be \$3.98/year (15 dozen eggs × \$0.2655/dozen), or \$15.93/year for a family of four. This increase would be considered rather modest relative to their total food costs.

However, it is uncertain if consumers will cut egg consumption based on this cost increase as predicted by the economic model, or if they would just keep buying eggs and pay the higher cost of producing them.

Based on this model, it seems most likely that if any drop in egg consumption occurs, it is probably going to be made by the lower income families or those who are already very heavy users of eggs.

A note about the proportion of the CA market relative to the entire country:

One possible scenario is that California has a shortage of eggs while the rest of the country has an over-supply. One of the things that should be considered is that the rest of the country uses a lot more eggs than California does. For example, 100 million eggs represent about one percent of the eggs consumed in California (under the assumptions above), but they only represent 0.14 percent of the eggs consumed in the rest of the country. Therefore it is expected that a shift of the same number of eggs on the supply would have a much greater impact on the California market than on the rest of the nation. For example, a shortage of 100 million eggs in California would increase the price by five percent, but a surplus of 100 million eggs in the rest of the country would decrease the price in the Midwest by 0.7 percent. Moreover, the rest of the US can still produce eggs at a cost that is competitive in the global market, leaving the opportunity to export.

MARKET UNKNOWNS

Any projection comes with a set of uncertainties and assumptions. This situation has its own set of unknowns that make the egg price predictions inside and outside the state extremely difficult. Here are just a few of the major ones:

1. We don't know the extent to which hen-housing conversion will be completed by January 1st. Without this information, it is not possible to know if we will have a market disruption because we could have a shortage or a less likely excess supply of compliant eggs.

2. No one knows for certain how Californians will react to changes in shell egg prices. Example options could be:
 - **Don't change.** Use the same amount of eggs and pay any potential price changes.
 - **Substitute.** Sometimes shell eggs can be substituted by using pasteurized egg products (liquid or dried). Since these products are already pasteurized, these products coming from other states do not need to comply with the new CA Shell Egg Food Safety Rule. As a result, the cost of producing processed eggs outside California shouldn't be affected. In this case, their price might not change much (unless it results in a change in the demand) and the market will determine if some consumers shift toward these egg products instead of shell eggs.
 - **Change.** Consume fewer eggs. Milk and eggs are the least expensive sources of high quality protein in the marketplace today. Therefore, it is unlikely that the consumers could substitute eggs with a less expensive option that provide a similar level of nutrition.
3. Cage-free housing requires an even higher premium in order to compensate for its higher cost of production than the enriched colony systems. However, because of the uncertainty of the space required by the new laws, many producers within California opted to invest in cage-free operations. It is unknown how many CA consumers would be willing to pay the price premium that is needed to cover these higher costs.
4. The year of 2014 was a strong year for egg demand. This might be a structural change of demand as consumers realized that eggs (and especially egg whites) are very high in protein and low in calories. If the market is currently at the beginning of a structural change in demand, price projection models based on historical observations would not be accurate.
5. Any type of calculation comes with what is called a confidence interval. This is the range within which the outcomes are expected to fall, e.g., 95 percent confidence interval. One of the assumptions around market prediction is the percent change in price as a function of the percent change in product supplied. In the EIC model, the historical data have shown these two things are not as directly related as they would seem. As a result, the predictions (estimated at -5.1%) have a fairly wide confidence interval (-1.8% to -8.4%). In summary, this means there are many other market influencers besides the supply of eggs.

SUMMARY

Hopefully this special report aids in understanding a fraction of the market forces that are about to grace us during the New Year. All the unknowns listed above have the potential to greatly impact the market. There are also many places where we had to make assumptions in this report to arrive at a figure to use for illustrative purposes. As a result, please note that the egg prices and quantities estimated in this report can differ appreciably from the reality in 2015.