

Director's Digest



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FAT ADDITIONS TO LAYER RATIONS

A PAYING PROPOSITION

In the course of research programs supported by FPRF, it is readily apparent and frequently mentioned that many of the programs take a long time to reach the point of commercialization. Obviously, some projects undertaken never reach the point of being of commercial value to the rendering industry. One of the objectives of FPRF, however, is to make sure that the research supported will have significance in the market place, either in terms of developing new markets for rendered products, or in expanding existing markets. If one assumes that 20% of the projects supported will pay off, one can be assured that the economic benefits to the industry will be of such magnitude that the total expenditures entailed will be well-justified.

As mentioned many times in the past, FPRF is not interested in "research for the sake of research." The primary consideration is whether or not the proposed research will increase the demand for rendered products. A good example of the projects supported is the extensive work that has been carried out at a number of institutions on fat for laying hens. When the work was undertaken several years ago, there was no reason to expect that adding fat to layer diets would be beneficial. In fact, too much energy, either as a result of excessive feed intake or as a result of too many calories in the formulation, was known to cause problems with hens that got too fat. The original purpose was to explore the so-called "extra-caloric" effect of fat addition to poultry diets. It had been known for a number of years that fat added to poultry diets often had an apparent energy value in excess of its chemically-determined gross

energy. Hens were one of the preferred test animals in the study of this phenomenon. Ultimately, the mystery of the "extra-caloric" effect of added fat was solved. The results, which by themselves might have been thought to be highly theoretical, were accompanied by performance data which really is the bottom line. Even so, the effect of dietary fat on the performance of laying hens was not a simple response. Rather, it consisted of a number of segments; the bits and pieces which must be assembled to describe an overall response. Defining these variables in the interest of arriving at an integrated whole is the "name of the game" in pursuing market-oriented, applied research of the type being supported at FPRF.

The value of fat added to layer feeds is manifested in a number of ways, as follows:

1. Increased egg size in young hens (24-40 weeks of age). This is significant because larger eggs bring a higher price, and young hens normally lay smaller eggs.
2. Increased egg production. This response does not hold through the entire laying cycle, but averages out to a meaningful improvement.
3. Improved feed efficiency throughout the entire laying cycle.
4. Improved utilization of feed nutrients, especially starch and protein.

The economics of the first three items, while somewhat complicated by present market condi-

tions, can be readily calculated. The significance of improved nutrient utilization is still under investigation, but may be manifested in lower feed costs to achieve the same levels of production. The following calculations of the economics of adding fat to layer diets are based on a number of assumptions which will be listed below.

COSTS USED FOR CALCULATIONS

- Soybean Meal - \$200.00/ton
- Corn - \$105.00/ton
- Fat - 15¢/lb.
- Layer feed (no added fat) - \$150.00/ton
- Layer feed (4% added fat) - \$158.56/ton

Ration modified for fat addition as follows:

- Add 80 lbs. of fat @ 15¢/lb. = \$12.00
- Add 16 lbs. of soybean meal @ 10¢/lb. = \$1.60
- Subtract 96 lbs. of corn @ 5.25¢/lb. = \$5.04

Net increase in feed cost from fat addition = \$8.56/ton.

Price received for eggs (on farm) = 45¢/doz.

RESPONSE DATA USED FOR CALCULATION

- Egg size - \$5.00/ton of feed advantage in increased egg size
- Egg production - 5.7% increase (250 vs. 264 eggs/year)
- Feed used - 8.4% less feed used per dozen eggs produced

OPTIONS AVAILABLE TO PRODUCERS (will affect net profitability of adding fat to layer diets)

1. Fat added to feeds for young hens only to increase egg size
2. Fat added throughout production period

It is obvious that there are many factors which would influence a producer's decision to add fat to layer diets. An overriding consideration in making such a decision is the fact that many, if not most, of the feed mills which make feed only for laying hens would have to add a fat handling system to the feed mill. Thus, profitability or (in the case of much of the industry today) reducing losses would have to be attractive

enough to justify the capital expenditure for a fat handling system. The many interactions and the resulting possibilities in defining responses are some of the reasons that describing the results of a research program can be relatively involved. They also explain why many worthwhile research projects extend over a period of years.

By using the data derived from FPRF-sponsored research with laying hens, the assumptions on costs and prices, and the options available, it is possible to calculate the economics of adding fat to laying hen diets.

CALCULATIONS OF PROFITABILITY OF ADDING FAT TO LAYER FEEDS (assuming 1000 birds, 52 wks. of production)

Option 1 (adding fat to feeds for young hens only to increase egg size), while significant in terms of the price of the eggs, is not one that is likely to be used exclusively. Research in this area shows that 2% fat addition gives the maximum egg size response with variable results in egg production. Adding 2% fat for the 1st 16 weeks of production resulted in an increase in egg value worth \$5.00 per ton of feed. Economics are calculated:

- Added cost of 2% fat/ton = \$4.28
- Added value per ton of feed = \$5.00
- Net return per ton = \$.72
- Feed consumed/1000 birds, tons = 12
- Return/1000 birds = \$8.60

It is unlikely that an egg producer would make an investment in fat handling equipment for such a small return. Because of production advantages, it is more likely that egg producers, if they added fat, would do so across the board. In this case, the increased value of egg size would be realized without increased incremental costs, as shown:

- Added value per ton of feed = \$5.00
- Feed consumed/1000 birds, tons = 12
- Return per 1000 birds = \$60.00

The economics of Option 2, reflecting the response to added fat, are calculated:

- Cost of feed/ton (4% added fat) = \$158.56
- Feed consumed/1000 birds, tons = 38.7
- Feed cost/1000 birds = \$6,110.00
- Eggs produced - dozens = 22,000
- Income from eggs (doz's x 45¢) = \$9,900.00
- Return over feed cost/1000 birds = \$3,790.00

Cost of feed/ton (no added fat) = \$150.00
 Feed consumed/1000 birds (tons) = 40
 Feed cost/1000 birds = \$6,000.00
 Eggs produced, dozens = 20,830
 Income from eggs (doz's x 45¢) = \$9,370.00
 Return over feed cost/1000 birds = \$3,370.00

Advantage of adding fat/1000 birds/year = \$420.

The bottom line is a significant increase in income when the effects of fat addition to layer diets on egg size, egg production and feed efficiency are considered.

Research is currently underway to determine the effects of improving the utilization of starch and protein through the addition of fat to layer diets. This work could well result in a reduction in the cost of feed, which, of course, would increase the returns from feeding fat.

In addition, a large-scale feeding study is being carried out on two commercial egg farms in Georgia to better define the response of laying hens to fat addition under commercial conditions. Results from these studies will

give insights into the effect of fat on feed separation in commercial houses; on the palatability of fat-supplemented feed for hens; on dust control in layer houses; on egg size and shell quality; on the possibility of using mill feeds, plus fat in place of more expensive grain; and on egg production and feed efficiency. The end result could well be a number of "bits and pieces" which might, when integrated, give a significant increase in returns to egg producers. In an industry chronically plagued with financial losses, this would, indeed, be welcome.

SUMMARY

Based on research results to date, adding fat to diets for laying hens results in increased egg size at a critical period in the production cycle, as well as a 5.7% improvement in egg production and an 8.4% reduction in feed required per dozen eggs produced. A combination of these factors can increase the returns per 1000 hens by as much as \$480.00. Based on the U.S. population of 280 million hens, this amounts to almost \$135,000,000.00 a year and represents a potential market for fat of about 900 million pounds a year.