AN EGG ECONOMICS UPDATE
THE FUTURE OF THE EGG INDUSTRY,
WHERE DO WE GO FROM HERE?

INTRODUCTION

Why do we have an egg industry? To provide the consumer with a plentiful supply of high quality eggs and egg products priced to allow a reasonable return on investments to producers, processors and retailers.

If we took a careful look at industry returns during the last twenty or so years, we would readily see that the concept of "reasonable return on investment" has not been achieved by our industry. In fact, average profits for producers since 1966 have averaged less than one cent per dozen. Losses in the 1987-88 period were estimated at $2.45 per hen in California.

Everyone has an opinion as to why the industry is in such bad shape. These include: industry expansion, decreasing demand for eggs, tax laws, foreign investors, crowding, flock recycling, high flock productivity and on and on.

TRENDS AND ISSUES

Population

U.S. population has increased by more than 50 million people since 1965. The current increase is at the rate of about 3 million people per year. In 1987, the human and laying hen populations were identical at 242 million. Regions with larger laying hen populations than human populations are considered surplus while regions with fewer chickens than humans are considered deficit.

The Industry

The egg production industry, with it's supporting network of pullet farms, feed mills, hatcheries, egg and fowl processors and other associated businesses is going through a major re-structuring with fewer and fewer firms each year and an increasing concentration of ownership and control. As a result, bigness is rewarded at the expense of the small: competition between firms has turned into open war-fare and efforts to solve industry problems cooperatively often end in failure, regardless of the issue.

Even though California is still by far the leading egg production state, the Indiana/Ohio/Pennsylvania region is the new "U.S. Egg Basket". Layer population estimates for that area are in excess of 55 million hens, 23% of the nation's table egg layer flock.
American Egg Board records (table 1) from 1980 to 1988 show a steady decrease (155 firms per year) in the number of firms with 10,000 or more layers and an increase in the number of hens per firm (10,000 more layers per firm per year). Firm numbers decreased from more than 2700 in 1980 to less than 1500 in 1988.

The annual "Big Company" survey conducted by the Watt Publishing Company in 1988 showed 51 firms with more than one million layers each. These firms were headquartered in practically every region with the largest concentrations occurring in California, Florida and Indiana. The 51 firms owned 135 million layers or 56% of the Nation's laying flock.

Performance

Flock productivity per hen in 1985 reached 245 eggs compared to only 217 in 1965, an increase of almost 1.5 eggs per hen per year. The productivity of the exceptional commercial flocks is almost unbelievable with hen-housed production to sixty weeks of age at 230 eggs compared to an industry average of 205 eggs. (table 2)

The major breeders are striving to decrease the age at sexual maturity, increase the absolute peak of production and decrease the rate of decline associated with age. Experimental flocks have been produced which have laid 240 eggs by sixty weeks of age. (table 3)

High performance is essential to high profitability. A flock producing 20 dozen eggs per hen at a cost of 45 cents per dozen is at a decided disadvantage to a flock producing 21 dozen eggs at a cost of 43.3 cents per dozen. The extra dozen eggs is produced at a cost of less than 10 cents per dozen.

Economics

If we were to ask one hundred typical egg producers "How profitable is the egg industry?" we would get answers ranging from "not at all" to "very high". The reason for this is that small differences in performance results, costs and income add up to large differences in profitability. Those companies with the ability to "put it all together!* are rewarded with good profits, even when the industry as a whole is barely breaking even.

U.S. farm costs to produce one dozen eggs in 1988 were estimated at 48.4 cents compared to 41.7 cents in 1987. Most of the increase was due to high feed costs during the latter half of 1988 which drove costs up to more than 52 cents per dozen during the third quarter. With industry average losses in 1988 estimated at one dollar per hen, it is unlikely that any producer could show a profit for the year.

Large Complexes

Even though large layer complexes are nothing new, the trend towards these large production units on the part of companies that were formerly involved exclusively with contract growers has given us surplus production beyond the ability of the industry to adjust. Too often, new units and the units they replaced are
operated concurrently resulting in excess overall production.

Individual complexes commonly represent one-half to one percent of the entire nation's layer population. The size is usually dictated by the capacity of new processing equipment rather than market needs.

The advantages of complexes are widely recognized: lower total investment, better labor efficiencies, closer supervision, in-line processing and less hauling costs. But, disadvantages are also present including: greater disease exposure, concentration of investment and risk, egg identity and counting problems, seven day processing and less grading accuracy relative to bloods and checks.

MAJOR ISSUES

The industry faces a wide array of issues which will affect it's direction in the future:

* Eggs as a part of the diet
* Determining value
* Industry self-control
* New technology
* Public interaction

Trends in Egg Consumption

Since per capita egg consumption records were first kept, we've seen three major trends occur. From 1909 to World War II, egg consumption averaged about 325 eggs per person with reduced consumption during World War I and the depression years. With the onset of World War II, egg production was encouraged and consumption reached a high of about 390 eggs per person during the 1945-50 period. Since 1950, egg consumption has steadily declined at about three eggs per person per year until 1988 when it is estimated that we now consume 242 eggs per person, the lowest point in the history of the records.

Since few eggs are imported into or exported from the U.S. and few are stored, per capita egg consumption is basically nothing else than per capita production. As the industry responds to low prices with reduced production, per capita egg consumption can go only one way, downwards. Strengthened demand with higher prices is required if per capita consumption levels are to rise.

Demand is measured by multiplying the volume of eggs purchased by its value. In absolute terms, these values reached a high of almost $18.00 per person in 1984, but in terms of "real" dollars (1967=100), we've seen consumer expenditures decrease from $16.00 per person in 1960 to only $4.00 in 1987. Interestingly, with decreasing per capita consumption and increasing population, U.S. table egg consumption has averaged 5.1 billion dozen eggs per year for the last 28 years with annual variations of less than 5% from the average.
Egg Marketing

The consolidation of the retailing business through mergers, the proliferation of new products and the seller's willingness to give his product away at near-cost, has put the retail buyer in a very strong bargaining position. Concessions to the buyer appear to be limited only by his imagination. Payment for shelf space and advertising, extended account periods, frequent cost-sharing sales and stocking and return agreements are but a few of the ways the retailer expresses his power over his suppliers. New products, in the future, will have to enter the market at very high "shelving" costs.

Retailers in Southern California have utilized pricing mark-ups three to four times greater than retailers in other parts of the country with the excuse "higher costs require it". It is not unusual to see consumer prices for eggs at three times the producer price. We know this results in higher supermarket profits and we can be fairly certain that it hurts eggs sales for the industry. Eggs at $1.50 and more per dozen must be prohibitively high for some segment of the consuming public.

Imaginative marketing is the method of improving your overall blend price by selling a significant portion of your eggs above the going market price. A blend price is made up of two factors: the optimum blend of sizes and quality and the optimum marketing blend with few eggs sold below the market price.

A five cent premium for extra large eggs and a ten cent premium for jumbo eggs, for example, will improve average egg prices two cents per dozen. This equates to 40 cents per hen or a ten percent return on investment.

Egg marketing firms must explore every avenue to improve their average blend prices. Discounted sales must be avoided by bringing production more in line with current market demands. Premium priced products must be tested and added where practical.

Egg Grading Standards

The standards by which we grade our eggs are meant to benefit the consumer and the producer. If conditions change, revision of our standards should be considered:

In a 1986 survey of 189 U.S. supermarkets in 26 states, 64% of the stores handled jumbo eggs while only 31% handled small eggs. These two sizes represent approximately 22% of all eggs produced. In addition, 31% of the stores handled three or fewer sizes.

With increasing processing and distribution costs, the high costs of maintaining large stores of packaging materials and the increasing consumption of egg products, should we not ask ourselves "Is the present six size system in the best interest of both the consumer and producer?"

A re-definition of egg size with a four ounce per dozen spread instead of the present three ounce spread and a reduction in the number of size categories might be a practical way of reducing costs in light of the changes now occurring in the table egg marketing and further processed segments of our industry.
Price Discovery

A one cent per dozen error in price discovery costs the egg industry one million dollars per week. If allowed to go uncorrected for an entire year, industry revenue will be affected by $50 million.

How can we say that the price should have been higher or that we shouldn't have gone down last week? Why does the industry offer lower prices?

Most agree that the demand side of the equation is very difficult to influence with pricing. A recent survey of West Coast marketeers credit downward price movements with:

* Stimulation of non-retail movements of eggs
* Reducing profit margins. Hens will be sold earlier, flocks will be molted and supply will go down.
* Altering market differentials, thereby causing eggs to move or stop moving between regions.
* Temporary increases in consumer sales if associated with lower consumer prices or sales.

Of these four consequences of lower prices, all but the last are intended to reduce or re-locate supplies rather than to encourage sales of surplus eggs.

What do marketing experts consider the number one problem with price discovery?

* We're weak sellers.
* Too much influence of a small number of firms with the market reporter.
* Quotes are based on opinion rather than on actual sales.
* Incorrect perception of value.
* We're over-reacting to imported eggs.

Egg prices traditionally fluctuate plus or minus 15% of the annual average. Does this system serve a useful function or does it merely confuse the consumer and her image of egg value?

In some countries, producer and consumer prices are maintained constant for a long period of time. The consumer knows what to expect; the producer can operate to recover costs.

Currently, many large buyers in the U.S. are approaching their suppliers about year-round pricing and formula-pricing. They say it would help their budgeting procedures if they knew their costs in advance even though the element of risk might actually result in higher costs. Egg prices based on cost-recovery would at least assure the average producer of a reasonable return on his investment.

- Public Interaction

In recent years, we've seen numerous examples of the fragile relationship which interfaces our industry and the general public. Animal welfare issues continue to surface with threatened legislative action. Disease epidemics are sensitizing the public as to the safety of its food supply. Zoning and land-use policies are forcing many of our producers to re-locate elsewhere.
These issues will not go away. The industry must develop sound policies regarding them. Each is potentially explosive and can result in permanent damage to the industry if not addressed properly.

TECHNOLOGICAL CHANGE

The development of new technology will continue at an ever-increasing rate. The early-adoption of sound technology will be the principle factor separating the ultimate survivors from those who drop by the wayside.

Pullet Quality

Flock performance will continue to be the most important contributor to the success of the egg firm and pullet quality will be the single most important factor affecting performance. The ability to repeatedly obtain breeder standard results flock after flock will be the margin necessary to remain competitive in the industry tomorrow.

Strain Evaluation

All strains are not identical. Each has specific strong traits to meet the needs of the egg producer. Each requires strain-specific management programs in order to optimize its performance. As we place more and more emphasis on further processed egg products, we'll place more emphasis on product yield. This will encourage flock evaluation based upon egg mass and pounds of feed per pound of eggs rather than on egg numbers and the more traditional pounds per dozen measurement.

Flock Recycling

Today, more than two-thirds of the layers in the U.S. are recycled. This will increase as egg mass is emphasized, livability is improved and new molting techniques are perfected.

Housing and Controlled Environment

Attention must be given to optimize environmental conditions for the entire flock. Variations in house environment dilute the benefits possible with well-designed ventilating systems.

Feeding Programs

Greater accuracy of formulation and feeding is required to assure the most economical feeding programs. Over-consumption due to excessive body weight, excessive egg weights, cold temperature, poor feathering or wastage can not be tolerated.

Controlled feeding of flocks will be utilized to reduce the high cost of body maintenance in larger hens within individual flocks.
Cage Density

The higher performance associated with lower stocking densities will be more widely recognized as a major contributor to higher flock profitability. Animal welfare guidelines will be changed to recommend increases in space allowances.

Security Management

With ever-increasing flock sizes, the multiple-age complex, and new exotic diseases waiting to explode, more strict policies regarding disease security will be essential. Farms will be fenced, doors locked and visitors excluded. Houses and farms will be totally depopulated, cleaned and disinfected between flocks. Rigid health monitoring programs will commence on day one and continue through-out the life of each flock.

Egg Processing

Egg grading and cartoning machines will continue to get bigger and more sophisticated. Five hundred case per hour machines will be available which will feature stain re-routing, camera/computer grading, robotic packing and assembly, in-plant pricing and in-line further processing. Individual eggs will be identified with light-sensitive markings to facilitate routing and to allow trace-back to their original source. This coding will also simplify data analysis for the individual flock.

Cholesterol

For years, the egg industry has lived with the stigma of cholesterol. Nature's most perfect food has a single component representing only .4% of it's weight that threatened to destroy the entire industry.

In 1988, the officially recognized cholesterol content of eggs was questioned by several astute egg producers and today we have the strong possibility that these levels will be adjusted downwards by 25%.

United Egg Producers studies by the Hazelton Laboratories have shown that large eggs contain only 208 mg. of cholesterol (compared to 274 mg. previously thought). If these figures are accepted by Federal authorities, we will have seen a major breakthrough in the battle against public misinformation.

More importantly, the discussion has stimulated research in feeding flocks and in further processing which could reduce levels even more. Products without cholesterol are currently available but yolks are not used. New processing methods will enable yolks to be used with greatly reduced cholesterol levels.

Further Processing - Value Added

In 1987, eggs broken for egg products totaled almost one billion dozens. During the 1984-87 period, per capita egg consumption in the product form rose 8.9 eggs compared to eggs in the shell form which went down 24.9 eggs. In 1987, egg products
were almost equally distributed between dried, frozen and fresh forms.

This segment of the industry represents a real opportunity to get eggs into other forms and into other meals. It also represents, to the innovator, a potential to incorporate the "value added" concept to eggs, an essential step if we are ever going to build profits back into our industry.

THE FUTURE

Future industry trends are best estimated by studying what's happened in the past. This technique, though, is somewhat risky especially with "downward" trends.

Pullet chick hatches have steadily gone down by 2.5 million per year since 1965 as a result of higher productivity, reduced per capita consumption of eggs and extended laying programs. In 1985, only 213 million pullet chicks were sold compared to 264 million in 1965. If these same trends continue, we would expect a need for only 175 million pullets by the year 2000. (figure 1)

Egg production per hen, on the other hand, has increased at the rate of 1.5 eggs per hen per year. If this trend continues, we would expect egg production per hen to reach 268 eggs, up about 20 eggs from today. (figure 2)

It is estimated that the average egg firm today owns about 150,000 layers. By the year 2000, this figure should exceed one-quarter million layers per firm. (figure 3)

In 1987, we saw layer and human populations reach the same level. By the year 2000, we expect 283 millions Americans and a layer flock of 220 million. (figure 4)

Egg consumption will continue to decline until we see a reversal in eating patterns. The annual rate of three less eggs per person per year will bring us to 208 eggs by the year 2000. (figure 5)

One exception to the "straight-line" trend pattern which exists for the above projections is the increasing pattern for processed egg consumption. If we follow the pattern established to 1985, we would project 20.4% of our eggs to be processed in the year 2000. When we look at the trend for 1983 to 1987, the estimate for the year 2000 is 31.2%. (figure 6)

We recognize that the structure of the business is changing with a significant shift to company-owned facilities in regions which were formerly heavily contract oriented. The December 1988 issue of Egg Industry asked 28 major companies to project their sources of eggs to the year 1993. These results are shown in the table below:

<table>
<thead>
<tr>
<th>Percent of Eggs By Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
</tr>
<tr>
<td>Company owned</td>
</tr>
<tr>
<td>Contract</td>
</tr>
<tr>
<td>Purchased</td>
</tr>
</tbody>
</table>
Egg Industry also asked their large company respondents to list the "biggest challenges" for the future. These are listed below:
* Production and processing efficiency and competition
* Developing new markets
* Personnel/manpower
* Financial/capital
* Waste handling

SUMMARY

Industry Trends:

<table>
<thead>
<tr>
<th>Category</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Population</td>
<td>+ 3 million/year</td>
</tr>
<tr>
<td>Eggs per Hen</td>
<td>+ 1.5/year</td>
</tr>
<tr>
<td>Pullet Chicks Hatched</td>
<td>- 2.5 million/year</td>
</tr>
<tr>
<td>Number of Firms</td>
<td>- 155/year</td>
</tr>
<tr>
<td>Size of Firms</td>
<td>+ 10,000 hens/year</td>
</tr>
<tr>
<td>Egg Consumption</td>
<td>- 3 eggs/person/year</td>
</tr>
</tbody>
</table>

The Year 2000

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Population</td>
<td>283 million</td>
</tr>
<tr>
<td>Eggs per Person</td>
<td>208</td>
</tr>
<tr>
<td>Eggs per Layer</td>
<td>268</td>
</tr>
<tr>
<td>Total Table Eggs Required</td>
<td>59 billion</td>
</tr>
<tr>
<td>Layers Required</td>
<td>220 million</td>
</tr>
</tbody>
</table>

835 firms at 263,000 layers per firm

The surviving companies must exhibit high management skills in:
* Finances
* Flock Care
* Processing
* Purchasing
* Marketing
* Personnel
* Public and Government Relations

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Donald Bell, Poultry Specialist
Cooperative Extension Annex #20
University of California
Riverside, CA 92521
Table 1

Table 2

Table 3

**"BEST COMMERCIAL EGG FLOCKS."**

(verified by breeders)

**BREEDER**

- **A**
  - H.H. EGGS TO 60: 242.7
  - ONE WEEK PEAK (%): 96.0
  - PEAK AGE (WKS): 27.5
  - WEEKS OVER 90%: 19
  - MORTALITY (%): 4.84
  - NUMBER HOUSED: 1641
  - HOUSING TYPE: ENV
  - SPACE/BIRD (SQ. IN.): 64"

- **B**
  - H.H. EGGS TO 60: 237.7
  - ONE WEEK PEAK (%): 96.0
  - PEAK AGE (WKS): 27.0
  - WEEKS OVER 90%: 21
  - MORTALITY (%): 7.03
  - NUMBER HOUSED: 24840
  - HOUSING TYPE: ENV
  - SPACE/BIRD (SQ. IN.): 54"

- **C**
  - H.H. EGGS TO 60: 228.5
  - ONE WEEK PEAK (%): 96.0
  - PEAK AGE (WKS): 34.0
  - WEEKS OVER 90%: 19
  - MORTALITY (%): 2.80
  - NUMBER HOUSED: 8020
  - HOUSING TYPE: ENV
  - SPACE/BIRD (SQ. IN.): 72"

November, 1988

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**U.S. EGG PRODUCERS BY SIZE OVER 10,000 LAYERS**

**U.S.COMMERCIAL LAYING FLOCK PERFORMANC 530 FLOCKS, 1986 HATCH DATES**

<table>
<thead>
<tr>
<th>TRAIT</th>
<th>BEST 25%</th>
<th>POOREST 25%</th>
<th>BEST 5%</th>
<th>POOREST 5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>H.D. PEAK %</td>
<td>91.4</td>
<td>82.0</td>
<td>95.7</td>
<td>65.8</td>
</tr>
<tr>
<td>H.D. AV. %</td>
<td>80.1</td>
<td>70.4</td>
<td>83.9</td>
<td>63.4</td>
</tr>
<tr>
<td>EGGS/H.H.</td>
<td>218.5</td>
<td>188.8</td>
<td>230.0</td>
<td>161.8</td>
</tr>
<tr>
<td>MORTALITY %</td>
<td>5.3</td>
<td>13.3</td>
<td>3.2</td>
<td>26.0</td>
</tr>
<tr>
<td>UNDERGRADES %</td>
<td>3.5</td>
<td>7.5</td>
<td>1.4</td>
<td>9.0</td>
</tr>
<tr>
<td>LBS. FEED/DAY</td>
<td>.206</td>
<td>.234</td>
<td>.193</td>
<td>.254</td>
</tr>
<tr>
<td>LBS FEED/DZ.</td>
<td>3.25</td>
<td>3.78</td>
<td>3.03</td>
<td>4.25</td>
</tr>
</tbody>
</table>

20 TO 60 WEEKS OF AGE
EGG-TYPE PULLET CHICK HATCH TO THE YEAR 2000

EGGS PER HEN TO THE YEAR 2000

Fig. 1

Fig. 2

SIZE OF EGG PRODUCING FIRMS TO THE YEAR 2000

PROJECTED HUMAN AND LAYER POPULATION TO THE YEAR 2000

Fig. 3

Fig. 4
PER CAPITA EGG CONSUMPTION TO THE YEAR 2000

**Fig. 5**

PERCENT OF EGGS PROCESSED (NON-SHELL FORMS) TO THE YEAR 2000

**Fig. 6**

PER CAPITA CONSUMPTION OF EGGS 1909 TO 1988

**Fig. 7**

THE ROLLER COASTER OF PROFITABILITY IN THE EGG INDUSTRY -- 1966 TO 1988

**Fig. 8**