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## Escalating Fuel Costs Hit Midwest, but Region Retains Feed Advantage



By Edward Clark, Editor

**D**iesel fuel that costs 60% more than two years ago and 20% more than just a year ago has hit the Midwest egg industry hard. Producers are affected by skyrocketing transportation costs wherever they are located, of course. But since both fresh eggs and further processed egg products must be transported great distances from the Midwest to major markets, the fuel cost hike is particularly burdensome on the major egg producing states of Iowa and Minnesota.

“We’ve been able to recover some, but not 100%” of the additional costs, says Travis Lubitz, logistics manager for Golden Oval Eggs, Renville, Minn. Yet while transportation costs are up considerably, he says fuel is still “a minor cost, but increasing. It has made an impact on our bottom line, something we’re starting to watch more closely.”

Wayne Carlson, vice president of logistics for Sparboe Companies, Litchfield, Minn., says that “all things being equal, higher fuel costs mean that Iowa and Minnesota lose some of their historical advantage,” because producers have to pay more to get egg

products to distant markets. He says higher transportation costs are a double whammy for the Midwest because egg firms such as his have to pay more to ship eggs to market, and they have to pay more to get Styrofoam™ and other packaging materials trucked in.

Nationally, the cost of getting fresh eggs to customers increased 1.6 cents per dozen from the first quarter of 2004 to the first quarter of 2006. For the Midwest, the cost rose 1.85 cents in the same time frame, notes Gene Gregory, vice president, United Egg Producers, Atlanta. This may not seem like a lot, but it comes on top of the losses most producers are suffering due to overproduction, says Gregory.

The transportation losses are not universally distributed to Midwest producers. “I’m probably not a good one to talk to because it doesn’t affect us — all our eggs are sold f.o.b.,” says Richard Hall, general manager, Southwest Iowa Egg Cooperative, Massena. However, he adds, “if we don’t get fuel costs under control it will bring our entire economy to a halt.”

No one interviewed for this report says that high diesel fuel costs will cause Midwest egg operations to shut down, but some believe it could determine where egg production grows. Asked if high energy costs could influence where Sparboe’s future production facilities are located, the company’s Carlson says, “very definitely. No question about that.” Sparboe currently has operations in Minnesota, Iowa, and Colorado. In terms of importance, he says that energy issues “are on par with labor and feed issues” that companies such as his consider before locating in a state.

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## Escalating Fuel Costs Hit Midwest |

### Feed favors Midwest

John Lawrence, economist at Iowa State University who has studied the egg industry, does not see the Midwest comparative advantage withering away due to high fuel costs. He cites one reason: feed. "It's less costly to move the final product than feed," he says.

That said, different states could vie for future production increases. Lawrence sees the possibility that if diesel costs stay high, egg production might grow more in states on the edges of the Corn Belt than in Iowa — Ohio, serving East Coast markets, and Nebraska, serving Los Angeles. Overall, however, there are many variables, "and there is still a natural advantage for Iowa," in Lawrence's view. He adds that while transportation costs have increased a few cents per pound for a tanker load of liquid eggs, "that's not very much."

Ohio State University economist Matthew Roberts does not rule out future growth of egg production in his state, but notes that Ohio producers have two disadvantages vs. Iowa producers: Ohio corn generally costs 15 to 20 cents more per bushel, and Ohio is more densely populated. The latter, he says, means that it can be tough to get a permit due to siting rules.

Golden Oval's Lubitz says that the math still favors the Midwest: It takes 2.5 lbs. of feed to produce 1 lb. of liquid eggs. As a result, some say that higher energy costs could actually advantage the Midwest over other regions that have to ship in grain.

### Ethanol raises costs

However, UEP's Gregory says that Iowa's historical advantage on feed may narrow due to the rapid growth of ethanol plants in the state. One reason Northwest Iowa and Southwest Minnesota have been so attractive to egg producers is that the basis for corn

has been so wide, so feed costs have been lower than in other areas. But that could be changing, he says. If so, Iowa could lose part of its comparative advantage vs. other states, Gregory says, although it's uncertain at this juncture just how much and whether that will offset the state's advantages. The state still is going to be producing a lot of corn, it's just that egg producers are going to have to be competing with ethanol plants to get it, he adds. Energy is important, but the cost of feed is far more important, Gregory says.

Fawzi Taha, egg specialist with USDA's Economic Research Service, says that higher energy prices have a definite impact on egg

production and prices: directly, due to higher transportation costs, "and indirectly, due to the new policy of converting part of U.S. corn and soybean production into ethanol and biodiesel," thus competing with U.S. feed supplies. Feed costs make up 60% to 65% of total egg production costs, depending on location and plant horizontal integration, he says.

Adds Ohio State's Roberts: "If you look at the value of a truckload of eggs vs. corn and soybean meal, there is no comparison. It makes sense to put layer facilities in an area where feed can be transported as little as possible." **EI**

## Any Relief from Diesel Prices in Sight?

**O**il can't stay at \$70 per barrel with corresponding high diesel prices forever. But within the next few months, diesel prices could actually increase from the current U.S. average price of just over \$3/gal., says Matthew Roberts, Ohio State University economist. Going out over the next few years, he looks for some price relief, but not much, with prices in the \$2.75 to \$2.80/gal. range.

Jim Ritterbusch, an energy consultant in Galena, Ill., sees short-term softness in diesel prices. He looks for prices to decline about 20 cents per gallon over the next month, and then strengthen to near present levels in the fourth quarter.

The shutdown of oil production on Alaska's North Slope will be less than earlier feared, which will moderate oil price hikes, Roberts says. However, he notes that North Slope oil largely affects only West Coast oil markets. For example, over the past three weeks, diesel prices have increased 17 cents in the far West, but only 6 cents in the Midwest. He adds that diesel generally costs 12 to 15 cents more in California than in the Midwest.

The U.S. Energy Information Administration says several factors are keeping fuel prices high now: demand — particularly from the United States and Asia — that outstrips non-OPEC supply growth; non-OPEC supply that has failed to meet expectations, due largely to last year's hurricanes in the United States; geopolitical issues in major OPEC producing nations that have lowered production and increased the risk of future production disruptions; and worldwide refining bottlenecks. The EIA does not expect those factors to ease in the short term.

Roberts says another factor that will keep diesel fuel costs high over the next few months is a new Environmental Protection Agency rule that requires sulfur in diesel fuel to be reduced to what's called ultra-low sulfur diesel. "Our trucks will be less efficient. It will take more fuel," says Travis Lubitz, logistics manager for Golden Oval Eggs, Renville, Minn. ■

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## ► New Egg Industry Editor

WATT welcomes Ed Clark as the new editor of *Egg Industry* magazine. Ed brings a strong background of more than 25 years in agribusiness journalism. He has been involved in writing, editing, editorial management, creating new domestic and international publications, conducting market research, and



Edward Clark

strategic publication positioning. Ed has a B.A. degree in journalism from Iowa State University. He lives in Minneapolis.

He owns Clark Communications, whose clients include a Chicago agriculture brokerage firm for which Ed writes a morning and afternoon market summary/analysis, and a weekly newsletter that analyzes dairy and feed markets; two agricultural magazines for which he writes business articles; the world's largest dairy cooperative; and occasional work for advertising companies.

Ed will also be editing the "Egg Industry Insider" e-newsletter that had its launch this month.

Chris Wright, who has served as editor of *Egg Industry* for the last three years and has been associated with the magazine for six years, will continue at WATT in his duties as editor of our Latin American poultry publication, developing new electronic media products for that market.

John Todd will continue attending the key US industry meetings and reporting on them, while Terry Evans in the UK will continue reporting on the International Egg Commission meetings.

## ► Cal-Maine Reports Results

Cal-Maine Foods, Inc. announced financial results for the fourth quarter and fiscal year ended June 3, 2006. For the fourth quarter of fiscal 2006, net sales were \$129.4 million compared with net sales of \$81.5 million for the fourth quarter a year ago. The company reported a net loss of \$210,000, or \$0.01 per basic share, for the fourth quarter of fiscal 2006 compared with a net loss of \$6.6 million,

or \$0.28 per basic share, for the year-earlier period. For the fiscal year 2006, net sales were \$477.6 million compared with net sales of \$375.3 million for fiscal 2005. The company reported a net loss of \$1.0 million, or \$0.04 per basic share, for fiscal 2006 compared with a net loss of \$10.4 million, or \$0.43 per basic share, in fiscal 2005.

## ► Specialty Egg Sales in U.S.

Research and Markets from Ireland recently published the results of a study on egg sales in the U.S., which found that, accounting for inflation, egg sales have decreased since 2000. However, specialty eggs are helping to stabilize egg sales, accounting for roughly 16% of egg sales in 2005. Concerns regarding ethical food production are promoting sales of organic, cage-free, free-range and vegetarian fed eggs. Interest in health drives sales of low-cholesterol eggs and those fortified with Omega-3 fatty acids and Vitamin E. This research found that 27% of respondents purchase specialty eggs, with 25-34 year olds and 55-64 year olds showing elevated levels of purchasing.

## ► Proposed Reduction in Eggs for WIC Recipients

In early August, the USDA published a proposed rule announcing revisions to the food packages offered in the Special Supplemental Nutrition Program for Women, Infants and Children, (WIC). Based on the proposed rule, the monthly allowance for eggs would be reduced from 2 to 2 1/2 dozen eggs to one dozen for children, pregnant women and partially breastfeeding women, and from 2 to 2 1/2 dozen to 2 dozen for fully breastfeeding women. According to the Egg Nutrition Center, a reduction in eggs would make it more difficult for WIC participants to meet their nutrient needs, since eggs are one of the most convenient and economical sources of protein available.

## ► Ben & Jerry's Drops Egg Supplier

Ice cream manufacturer Ben & Jerry's Homemade Inc. said it will drop an egg supplier accused of mistreating chickens, responding to pressure from the Humane

Society of the United States. The change would start in September. The Humane Society said an investigation of a Michael Foods egg farm in June reported finding mistreated hens. Michael Foods said it planned to switch to larger cages to meet or exceed United Egg Producer guidelines for hen welfare.

## ► Land O'Lakes Report

Land O'Lakes reported that their layer egg business performed better than last year, driven in part by the sale of the eggs product business at the end of June. During the second quarter, they completed the sale of MoArk liquid egg products business to Golden Oval Eggs. MoArk LLC, realized a loss of 6.7 on a normalized EBITDA basis, versus a normalized EBITDA loss of 11.2 million for the first half of 2005. Land O'Lakes will continue to evaluate repositioning alternatives for the remaining MoArk shell egg business. MoArk is well positioned in its industry and has a strong future with opportunities for growth. However, this business is not a good strategic fit for Land O'Lakes' portfolio which will continue to investigate the potential for joint venture arrangements, sales or partnerships, which will maximize the value of this asset.

## ► Mexico Mayo Manufacturers

USAPEEC's egg consultant in Mexico conducted a seminar for the country's third-largest maker of mayonnaise on the usage of U.S. processed egg products.

USAPEEC Mexico Director, José Luis Cruz, said that the seminar, sponsored by the American Egg Board, was directed at the technical staff of the manufacturer, La Costeña, and of its sister company, Sabormex. The companies are interested in several different products, including enzyme-modified frozen whole egg yolk.

A number of production and quality control staff members took part in the seminar, which focused on the attributes of egg products, food safety, egg usage, quality control and processing methods. As a result of the seminar, La Costeña is expected to use more than 800 metric tons of product per month, Cruz said. **EI**

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# Promoting U.S. Egg Products Overseas Amid the AI Crisis

By Jennifer Geck, USAPEEC

**W**e've all heard about the devastating effects that the Avian Influenza (AI) crisis has had on the U.S. poultry industry's exports due to consumer fears of eating poultry and due to key markets imposing import bans since October 2005. But what about the egg industry?

The good news is that egg consumption appears not to have been impacted by



Jennifer Geck

AI as much as chicken consumption in most export markets. On the other hand, according to USDA's Foreign Agricultural Service statistics, U.S. shell egg exports for the first half of 2006 took a sharp decline by 31% in volume and by 25% in value over the same period last year. Surprisingly, however, exports of U.S. egg products made significant increases in both volume (8%) and value (7%) for the first half of 2006 compared to the same period last year.

Despite the increased export volume and value for U.S. egg products for the first half of the year, there is concern in the egg industry whether unjustifiable restrictions will cause problems for future shipments.

Given the concerns, USA Poultry & Egg Export Council (USAPEEC), a non-profit trade association, headquartered in Stone Mountain, Georgia with 13 international offices, has quickly adapted its strategies to deal with numerous trade restrictions and worldwide consumer resistance. As a proactive approach, USAPEEC set aside over \$1 million of its government

and industry funds for a worldwide campaign aimed at addressing AI concerns for poultry and eggs. USAPEEC also receives significant funding from the American Egg Board which has been used to develop, maintain, and protect important markets for U.S. eggs and egg products.

## South Korea

South Korea is a top market for U.S. egg products. In fact, U.S. egg product exports to Korea rose 13% in value to \$3.8 million for 2005 and 39% in volume to 2,112 metric tons.

Food safety has become a very important issue, especially during 2005 due to consumer concerns over contaminated food. As a result, the food industry is focusing on high quality, safe products to meet consumer

demand. Adding to the concerns was the occurrence of AI, which discouraged consumers from eating poultry products including eggs. The good news, however, is that egg consumption is picking up, thanks to the latest research released as well as to press releases that show that consuming eggs is safe.

While consumer concerns about safety provide excellent opportunities to promote U.S. egg products, there are some remaining constraints for U.S. egg products in the Korean market. Those constraints include the low price of local fresh egg and egg products and the increased competition from China, Thailand, Netherlands, France, and Denmark. Importers have been working to introduce various egg products from all countries to their customers; however, due to the lack

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To encourage the bakery industry to use more U.S. eggs and egg products, USAPEEC has worked with the Hong Kong Bakery & Confectionery Association this year to place advertisements in its bi-monthly magazine, "Today's Bakery."

of good knowledge from the importers on the products, inadequate products are often delivered to end users. Thus, a misconception that processed egg products do not perform as well as local shell eggs has been formed.

In order to improve the understanding of the high quality of U.S. egg products and their correct applications, USAPEEC has distributed and developed educational materials such as newsletters and a website and has conducted technical seminars. In March USAPEEC participated in the Food & Hotel Korea show. The promotion, sponsored by the American Egg Board, featured cooking demonstrations using U.S. egg products and technical consultations by Dr. Shelly McKee of Auburn University. The show attracted thousands of visitors including food companies from 18 countries. Michael Foods, Primera Foods and Sunny Fresh Foods supplied products used in the cooking and recipe demonstrations.

### Hong Kong

Although Hong Kong is more of a shell egg market, egg products are making strides in the foodservice sector. Frozen liquid eggs are the most popular egg products used there. Hong Kong imported approximately 723 metric tons of egg products from the U.S. in 2005, valued at US\$1.1 million. In the first six months of 2006, imports reached 480 metric tons with a value of US\$751,000.

Amid the AI scare earlier this year, some hotels have switched to using pasteurized liquid eggs instead of shell eggs even though the cost was 30% higher.

To encourage the bakery industry to use more U.S. eggs and egg products, USAPEEC has worked with the Hong Kong Bakery & Confectionery Association this year to place advertisements in its bi-monthly magazine, "Today's Bakery" in the May, July, September and November issues. This magazine is distributed to some 4,000+ members, most of whom are bakery chefs. A colored editorial page featuring U.S. egg and egg product information is given free of charge by the publisher in these four issues. Since the advertisement started running, a bakery chain from Taiwan, which wants to open outlets in Hong

Kong, called the USAPEEC Hong Kong office for contact information on U.S. frozen liquid egg whites.

### Middle East

The Middle East ranks 7th in terms of volume and value in the list of leading regional export markets for U.S. eggs and egg products in 2005. Total import volume is about 388 metric tons, worth around \$5 million, an increase of 70% in terms of volume from 2004 USDA figures.

While the AI crisis led to the ban of U.S. poultry imports in the region, egg imports for the most part were not restricted. However, with the AI outbreaks in India and Europe, particularly the Netherlands, importers of eggs from these sources shifted to the U.S. Such a shift was evident at the USAPEEC/American Egg Board booth at the Gulf Food Show where a large number of importers filled out trade leads for eggs.

While consumption of poultry and



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**| Promoting U.S. Egg Products Overseas |**

eggs decreased by more than 50% at the height of the AI crisis, thankfully, the negative effects have now diminished and countries that had previously banned egg imports are now resuming their trade; for example, Egypt has lifted the ban on imports of eggs and major traders are showing interest in U.S. egg products for use in confectioneries.



In Singapore, a “Noodle-Making Workshop” using U.S. liquid eggs educated manufacturers on how to use liquid eggs as an alternative to shell eggs. The event was covered by the local press.

**Mexico**

Egg product exports to Mexico have substantially increased, making it the third largest export market for U.S. egg products. Value increased by 87% to \$13.1 million in 2005.

Mexican consumption of table eggs and egg products remains unaffected as a result of the AI outbreaks in some countries around the world. In fact most local consumers associate AI concerns with broilers, but not with eggs. Overall poultry consumption in Mexico has not been negatively affected by AI since the country remains free of the virus.

As a result, USAPEEC activities such as customized seminars with the mayonnaise industry and trade shows in the market have not been interrupted and U.S. egg product exports continue to soar. In addition, new opportunities now exist for U.S. shell eggs, as the domestic price for eggs is on the rise.

**Singapore**

The AI outbreak in Malaysia two years ago caused a shortage of fresh egg supplies to Singapore, dramatically increasing the price of the eggs. Singapore quickly turned to alternate sources of eggs, as 70% of its imports came from Malaysia. In light of the AI

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outbreaks, egg products were viewed as the next best alternative by Singapore's Agri-food & Veterinary Authority of Singapore (AVA), especially in the Hotel & Restaurant Institutions (HRI) sector where large amounts of eggs are needed on a daily basis.

Currently, the local consumption of eggs and egg products annually is 76,000 tons with only 1% of the total being egg product consumption. With such constraints as low egg product consumption and a local perception that egg products are unnatural, AVA has begun an educational and promotional campaign to encourage the trade to use egg products so as to expand the supply source of eggs. Their goal is to increase the consumption of egg products to 10% within three years.

With AVA's endorsement, USAPEEC Singapore has been instrumental in getting the local HRI to begin using liquid eggs through seminars and trade events, including having a USAPEEC/American Egg Board booth for the first time at the Food & Hotel Asia trade show.

Recently, USAPEEC Singapore, together with AVA, USDA Singapore and Singapore Polytechnic, jointly organized

a Noodle-Making Workshop using U.S. liquid eggs. The goal was to educate the 22 noodle-manufacturers on how to use liquid eggs as an alternative to shell eggs in the application. U.S. egg companies, Michael Foods and Sunny Fresh Foods, contributed samples and were each provided with a table-space to display their egg products and brochures. The event was covered by the local press in newspapers and television.

In addition to targeting the local noodle manufacturers, AVA plans to target the confectionery trade, HRI sector, food and beverage manufacturers, and food hawkers to promote the use of liquid eggs. **EI**



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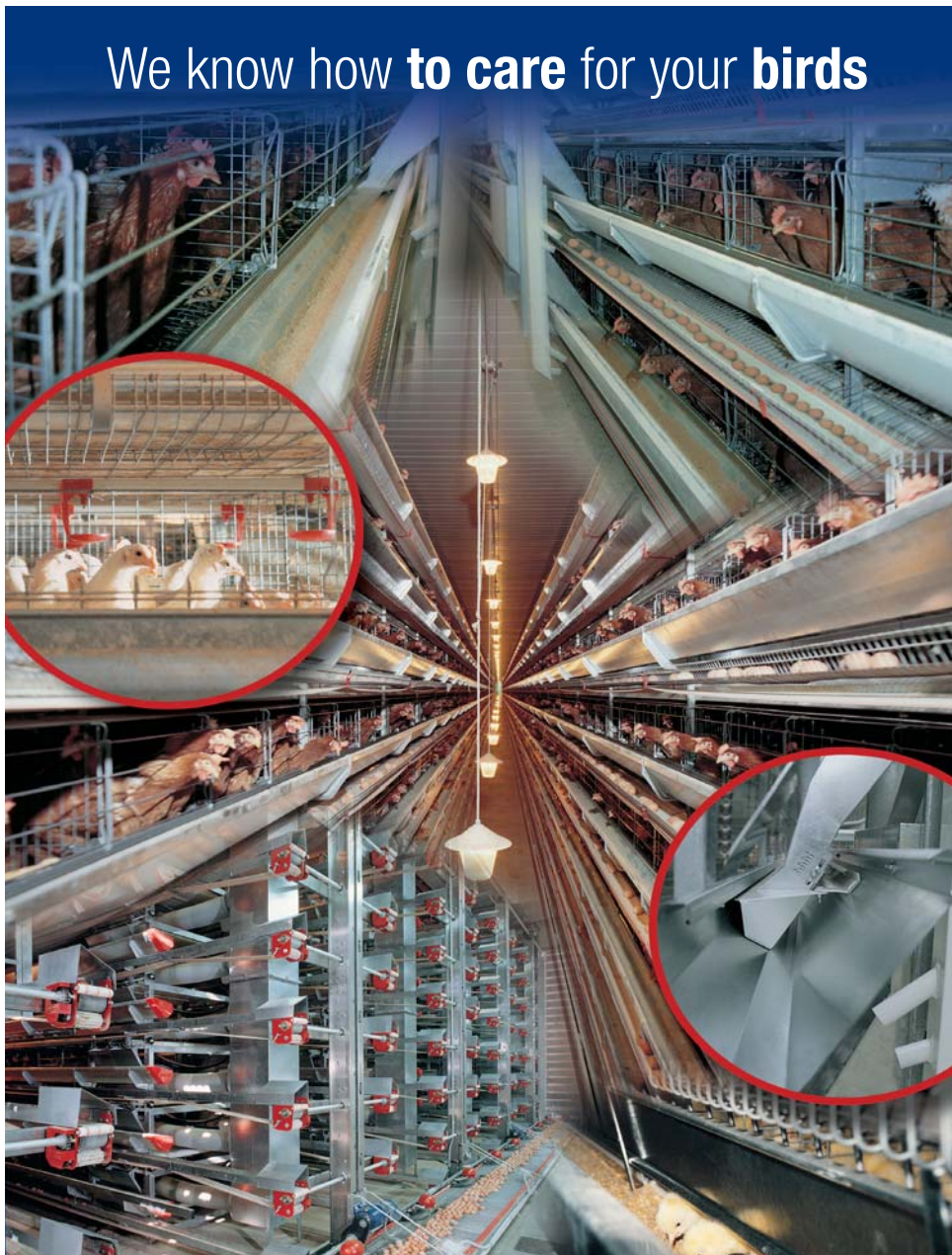
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# El Salvador's Egg Sector

*El Salvador's dynamic egg laying industry has taken an important leadership role in Central America.*

By Chris Wright, Editor, Industria Avicola

At 170 eggs per person/year, El Salvador has the third highest consumption level in Latin America, behind Mexico and Colombia. El Salvador has a population of 6 million people; however, it's estimated that about half of these live in the U.S. With such high consumption, it is hard to maintain growth, but at least the industry has remained stable for over four years. The country has completely changed its eggs preference. Years ago, it was a 100% white egg market, while today it's a 90% brown egg market.

It is almost impossible to discuss the laying hen sector in El Salvador without also covering Guatemala and Honduras, because there is so much connection with the industries in these countries. This is mainly due to the fact that the largest Salvadoran egg companies have, for many years, had operations in Guatemala and Honduras.

The Salvadoran egg companies are among the most technologically advanced in the Latin American egg sector. Recent projects include some of the most modern tunnel ventilation poultry houses, not only in Central America, but also in all of Latin America.

## Mega-Distributors

The egg mega-distributor concept has been in practice for several years in El Salvador,

Honduras, and Guatemala. It is a simple concept: egg producing companies focus on producing the eggs, which they later turn over to the mega-distributors in charge of distribution and sales. Each company takes care of its own packaging, branding, and product delivery to the distributor.

In El Salvador, the mega-distribution company is called EGG – which stands for Empresa de Granjas Guanacas (Salvadoran Farm Company). In Guatemala, they also go by the name EGG – Empresa de Granjas Guatemaltecas (Guatemalan Farm Company) and in Honduras they are known as Megadistribuidora Avicola (Poultry Mega-Distributor). This concept started in Guatemala in 1999, when several egg distribution companies joined together under the name Dansa. This company was not successful and disappeared, but served as the model from which many lessons were drawn and from which other mega-distributors were born. Today, EGG Guatemala has two partners, Megadistribuidora Avicola in Honduras has 23 and EGG El Salvador has four.

Each of the mega-distributors works



independently, meaning they supply the local market at local prices, as opposed to regional ones.

The Salvadoran company El Granjero plays an important role in the EGG. In addition, they participate with the Empresa Avicola Julia in the EGG in Guatemala, as well as with Avicola Santa Rosa in the Megadistribuidora Avicola in Honduras. The Lemus-O'Byrne Group also plays an important role in the El Salvador EGG and with CAPH in the Honduran Megadistribuidora Avicola.

Avimac and Cocolima are the other two companies with participation in the El Salvador EGG.

José Alberto González, executive director for EGG in El Salvador (and the executive director of El Granjero), explains the concept, "Each company makes a contribution to keep us operating, and we subtract the sales price. That is to say, if the distributor sold 200 but only needed 20, then we keep 20 and return the rest to the egg producers. We do this because we are a non-profit organization. That way we can transfer all benefits to the price, to save on production costs and



Inside the distribution facility.



A tunnel ventilation house at the Lemus-O'Byrne farm.

to create economies of scale in distribution which we can then transfer onto the product. None of the three distributors generate profits, they all generate service.

"The mega-distributors are willing to take on new partners and new products, as long as they are in compliance with our established standards, such as the yolk color, shell thickness, and freshness, controls which are applicable to all.

"We talk about being together, yet apart. That is, we all deliver the eggs at the distribution center, and let them do their own thing. Branded products for supermarkets are packaged by each company under their own label. The bulk eggs, which go to stores and farmers markets, come in 30-egg flats from each company, but they are not branded.

"Distribution companies are concerned about not exceeding the number of days within the distributor's internal rotation, which should not be more than three or four days in any of the storage facilities. Client rotation can take place as often as required, but what we look for is the egg not to age. We always want to offer a fresh product.

"The vision is to seek out new partners to reduce costs and offer clients a more affordable price. I will offer the end consumer the lowest price in the market, but in exchange, I want a greater market share," concludes González.

### The Lemus-O'Byrne Group

This group owns the second largest laying hen company in El Salvador, with 900,000 Hy-Line layers in production, and 250,000 layers in production in Tegucigalpa, Honduras. Both companies have Roberto Lemus González as the executive president, who also serves as president for Megadistribuidora Avícola in Honduras.

Roberto Lemus-O'Byrne, production director, speaks about the investments in their poultry houses. "The three newest houses, the tunnel ones, are three years old. They were the first of its kind to be installed in Latin America, from Chore-Time. We built them new, as part of an expansion and centralization effort. The new poultry houses are very good, yields are high. If we keep a good temperature, we only have a one-degree (Celsius) temperature difference between the front and center of the poultry houses, because the extractors are on the sides and the cooling pads are on the ends.

"We were affected by the earthquakes in January and February of 2001; 40% of our equipment was damaged, the poultry houses collapsed. We had to undertake a

reengineering process unlike any other, which we thought wouldn't yield results. After eight months of intense work, we were able to rebuild the farm. In October 2005, hurricane Stan hit and we lost 100,000 birds to the flooding on the pullet farms," recalls Roberto Lemus-O'Byrne.

### El Granjero

El Granjero, S.A. is the largest commercial layer company in El Salvador, with 1 million layers in production. Carmen Elena Díaz de Sol is the company's president and she is also a special Presidential Agricultural Commissioner for El Salvador.

Carmen Elena Díaz de Sol also is president of Avícola Santa Rosa in Honduras, with 210,000 layers in production; president of Avícola Julia in Guatemala, with 950,000 layers; president of the distribution companies in El Salvador and Guatemala; as well as being vice president of the Honduran distribution company. Ms. Díaz

de Sol heads the largest egg operations in all Central America.

El Granjero is known throughout Central America for its dynamism and especially for their cutting edge technology in layer production. They were the first in Central America (and very likely in Latin America) to use the most advanced technology to build their new tunnel ventilation houses, back in the year 2000. One of these houses was in place when the 2001 earthquakes hit, which destroyed many of the poultry houses, but did not damage the new tunnel ventilation house, and for this it was nicknamed the "Titanic". Later, two more of the same type were built. These are Chore-Time houses and equipment.



Carmen Elena Díaz de Sol heads the largest egg operations in Central America.

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## | El Salvador's Egg Sector |

The poultry houses have "stack deck"-type cages with six levels, each one with a manure belt. There is a second deck for the poultry house workers – three levels of cages are supervised from the bottom and three from the top.

The manure belts are used every other day, which represents less wear and tear on the system, compared to using them once a week. Egg collection takes place automatically,



El Granjero tunnel ventilation house.

though in the classification area, the work is done manually. The extractors are at the end of the tunnel and the evaporation pads are at the entrance.

## Criaves

Without a doubt, Criaves is one of the best-known names in the Central American poultry industry. With over 30 years of existence, the company is known for being the hatchery which supplies an important percentage of the pullets and one-day-old chicks bred in Central America. Particularly, their market share in the regional egg layer market segment is unmatched.

Criaves produces and sells close to 8 million layer pullets a year, (Hy-Line W98 and Brown) with exclusive distribution rights for the Central American region. Thus, it is



Brown chicks at the Criaves hatchery.

the largest pullet hatchery in Central America. Given that at this time there are almost 17 million layers in production in all of Central America, the fact that Criaves hatches almost half of them, is quite remarkable. There are only six companies in all of Latin America which hatch more pullets a year than Criaves. A significant percentage of these pullets remain in El Salvador and the rest are exported.

Before the year 2000, Criaves exported chicks and pullets to Central America and Mexico. All this changed when circulation of the low pathogenic Avian Influenza virus was detected in several countries in the region, affecting regional commerce for chicks and pullets. As a consequence, some hatcheries made adjustments and complied with the sanitary requirements established by international standards to export their products. A few months later they were able to get back to regional commerce. This is considered a very important period for Criaves because, despite the threat, they were able to maintain their presence in the entire region, opening operations in Costa Rica to supply that country as well as the Nicaraguan market. **EI**

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## Pulsed Electric Field Holds Promise

**E**gg white proteins are quite susceptible to heat damage. It has been shown that pasteurization temperatures used by the industry today may decrease foaming properties of egg white. Liquid egg white is pasteurized at 56.7°C for 3.5 minutes. The industry also pasteurizes egg white using a combination of hydrogen peroxide and heat.

Injection of hydrogen peroxide into the holding tube allows for a lower pasteurization temperature at 51.7°C. The heat plus hydrogen peroxide method minimizes damage to egg white proteins. There is a continuing need to develop improved pasteurization methods for egg white. Pulsed electric field (PEF) has been proposed as a non-thermal method for inactivating pathogenic and spoilage organisms in food systems.

Very few studies have investigated the combination of heat and PEF as a pasteurization method. A new study by Amiali *et al.*, 2006 (*Journal of Food Science* 71:M88-M94) evaluated the effect of heat in combination with PEF on inactivation of *S. enteritidis* (SE) and *E. coli* 0157:H7.

They inoculated egg white with 10<sup>8</sup> colony-forming units of *E. coli* 0157:H7 and SE. Inoculated egg white was treated with a continuous flow PEF system at 60 pulses (2µs width) using electric field intensities of 20 and 30 KV/cm. Temperatures used were 10°C, 20°C or 30°C.

The combination of PEF and heat provided a maximum inactivation of *E. coli* 0157:H7 cells of 1.7, 1.9 and 2.9 logs at 10°C, 20°C and 30°C, respectively. S.E. inactivations of 1.8, 2.6 and 3.7 logs were observed at 10°C, 20°C and 30°C. They found that the number of pulses was most important followed by temperature and electric field in providing inactivation of these two pathogens. There was a synergistic interaction of temperature and PEF on microbial inactivation in liquid egg white.

This research indicates some potential for using pulsed electric fields in combination with heat as a pasteurization method. Further studies varying the pulse rate and temperature to give a better log reduction perhaps warrant further study. For example, temperatures between 40° and 50°C in

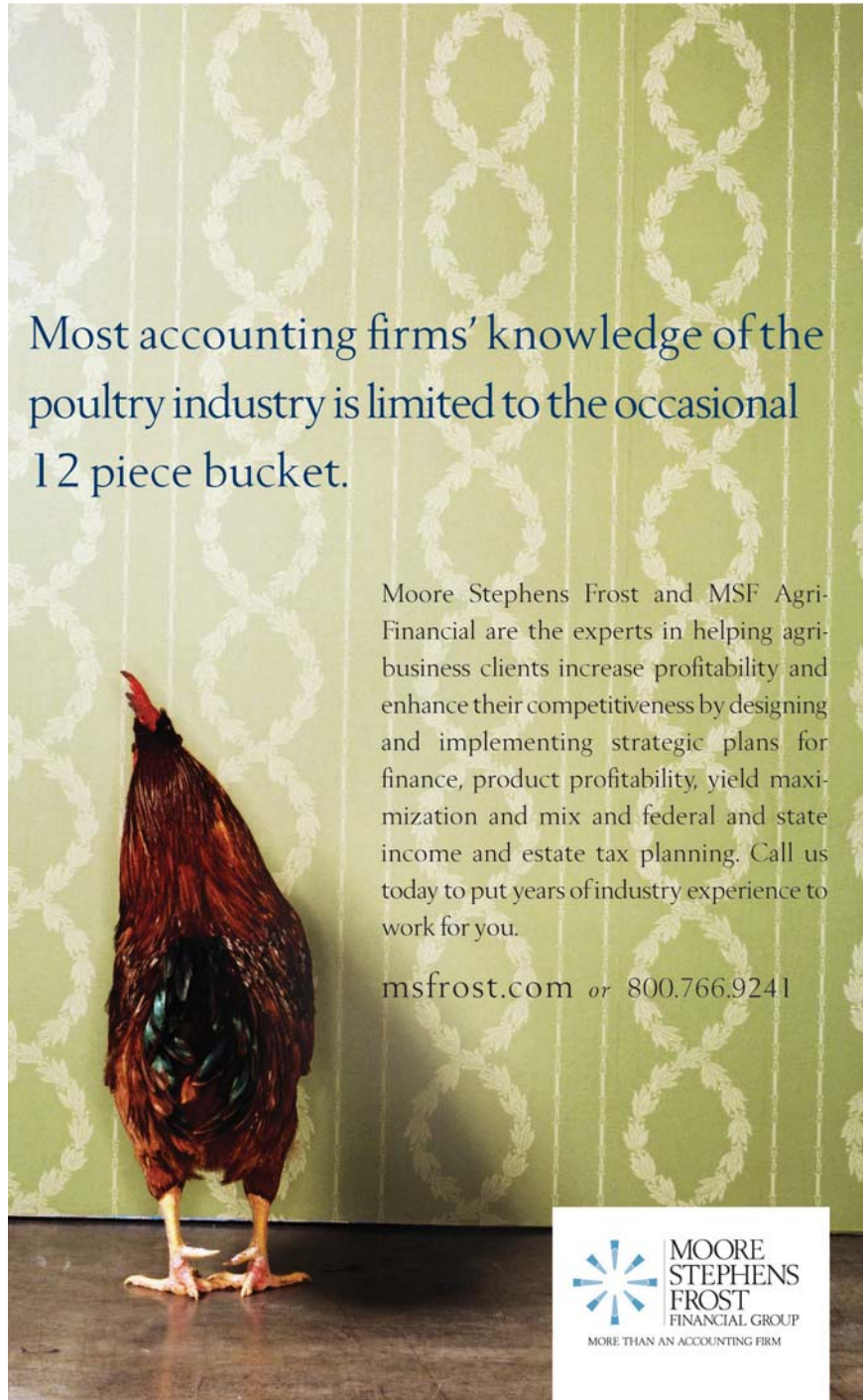
combination with PEF may provide better log reductions. It would be necessary to have a better log reduction than 3.7 logs for application of PEF by the egg products

industry. As this non-thermal method is further considered, there is a need to investigate the effect of combined heat and PEF on functional properties. **EI**

Most accounting firms' knowledge of the poultry industry is limited to the occasional 12 piece bucket.

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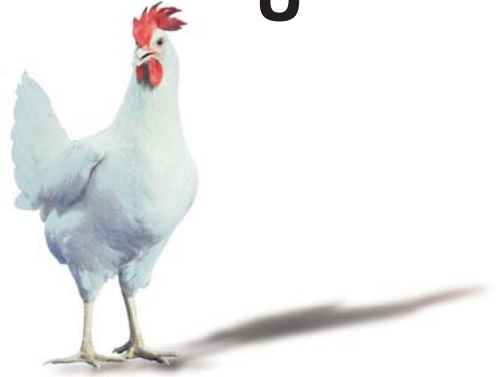
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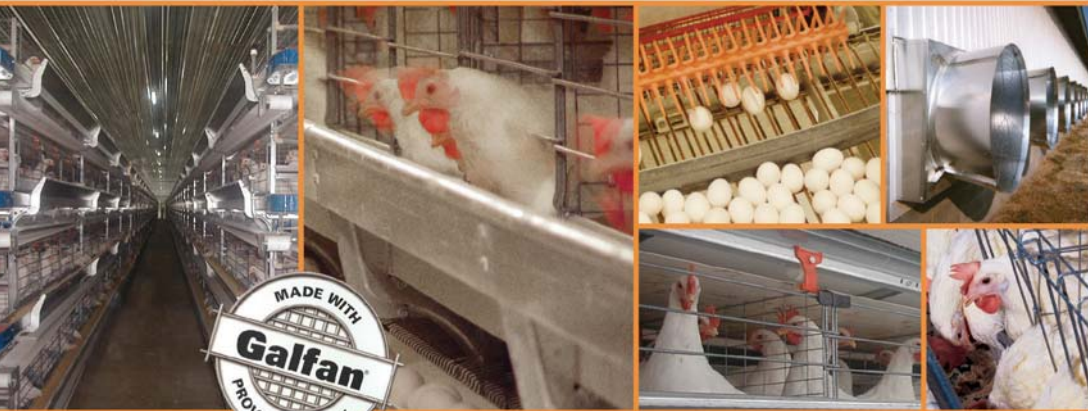
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