

Asia and eggs: is there room for industrialisation?

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Of the 60 million tons of eggs being produced in the world, 40 million come from Asia, and nearly 30 million come from China alone. We tend to look at Asia as one area, but each of the 15 countries making up Asia is different from the others, both in regards to culture, religion, wealth, infrastructure and also eating habits and much more.

Despite this, the egg industry is still not quite developed and there is major room for industrialisation leading to higher efficiency and improved returns. In most of Asia, excluding Japan, fresh eggs are still the main product in the egg industry.

In all of Asia there are only 110 further egg processing factories and laying farms with modern cage systems in environmental housing are still at a minimum. Most regions have smaller laying flocks with birds being kept in open houses. In China over 80% of the layers are from smaller backyard farms (less than 3,000 birds), but new and highly advanced industrialised farms are showing up now, with flocks in the millions.

The main concerns with open houses and smaller flocks are disease prevention, quality control and cost control.

The major buzz words in the poultry and egg industries around the world are safety and disease

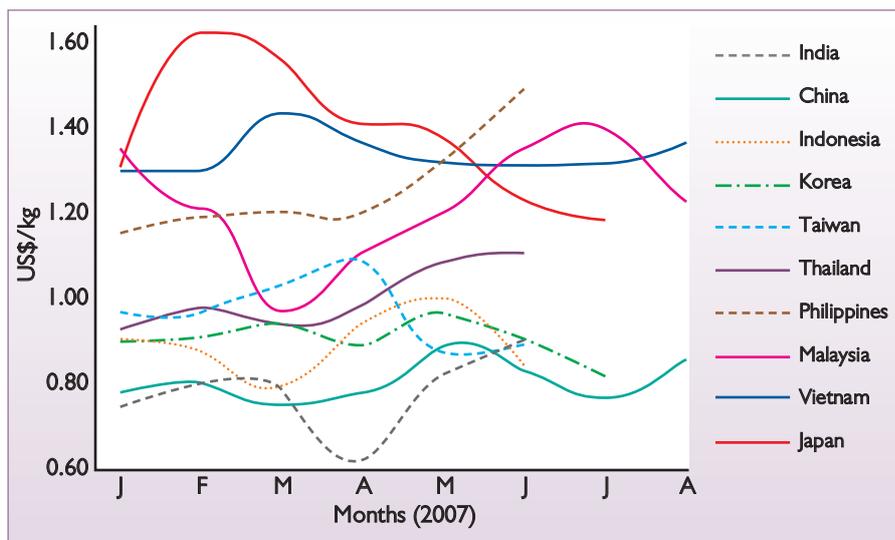


Fig. 1. Asia farm gate egg prices 2007.

prevention, with a big focus on avian influenza (AI). AI continues to disrupt the industry putting great strain on an already difficult industry facing tremendous fluctuations. Now, the industry is also facing increasing feed costs, primarily due to the production of bio fuels made from corn. As most farms in Asia tend to be smaller to mid size farms without their own feed production, these farms become increasingly subject to the fluctuations in feed costs and vulnerable to diseases.

Furthermore, it becomes difficult to control the quality of the egg production, as there is little or no control with the use of antibiotics and nitrofurans in the feed.

Today, another buzz word is traceability. In order to export, more and more documentation is required, both due to safety reasons but also as a measure to control trade.

Traceability is also becoming a matter of national concern, and a growing demand from large super and hyper markets. This further brings about the need to set up controlled environments with individual handling of eggs and tracing of the farms and sheds. Printing on each egg, with date of lay and a tracking number, means it is possi-

ble to track the egg backwards to which shed it came from and, thereby, determine which batch of feed was used at the time.

Egg prices fluctuate widely within Asia, with prices being influenced by factors such as domestic consumption, degree of industrialisation, disease prevention and reliance of imported feed. In Fig. 1, the price differences are evident. The graph shows that India has the lowest prices of eggs by far, a result of the very low domestic consumption. At the opposite end is Japan, with a very large domestic consumption.

The odd one out is China. It also has a very large domestic consumption, more than 90% are consumed inside China, but the extremely large production base means the costs remain low.

Avian influenza

In China, farmers were initially hit hard by the impact of bird flu, but the outbreaks may ultimately push China to improve its poultry rearing practices.

According to Wang Jimin, a researcher with the Chinese Academy of Agricultural Sciences, bird flu has adversely affected the poultry raising sector, but in the long haul, it will also prompt a transformation of the

Continued on page 27

Continued from page 25

(backward) rearing methods, forcing the industry to develop along a healthy and sustainable track. At least 40% of China's poultry is raised in scattered, small courtyard farms in substandard conditions, making them vulnerable to possible contagious diseases. The bird flu infection will make farmers more aware of the risks in the sector.

Zhang Zhongqiu, vice director of the ministry of Agriculture's Animal Husbandry Department, added that, following the epidemic, the Ministry has started to advocate the development of intensive farming and worked to optimise its stock raising method. The same effects can be seen across the region.

As a result, more and more large scale industrial poultry farming is being seen, following the practises seen in the EU and US, in some cases even going beyond standard practises. The photograph, right, shows a recently established farm, completely integrated and self sufficient, adhering to an ecological production principle and recycling the manure to produce fertiliser and energy for the farm.

The farm has a total of 3,000,000 layers all housed in closed housing with eight tier cages. Eggs are collected automatically and transferred by underground conveyor to a grading and packing centre. 25% of the eggs are transferred to a state of the art further processing plant, all situated within the compound. The farm is complete with its own feedmill and the entire process is subject to stringent critical control systems, to ensure full traceability.

Raw material

Control of laying hens is imperative. Quality starts with the hen and correct management of laying farms is the key to further development.

Strictly adhering to international standards is crucial in order to be able to export and sell to international companies.



A completely integrated and self sufficient layer complex.

Banning the use of antibiotics, pesticides and other harmful agents is a necessity. This is difficult to control in small scale production facilities.

Economies of scale are important, and therefore smaller farm units could cooperate with one another and establish larger scale operations.

Central production units in each area will benefit the farmers through economies of scale, ranging from procurement of quality approved feed/ingredients, to handling and distribution.

Uniting smaller farms into larger industrialised operations will allow for the introduction of modern grading and handling systems, and further facilitate an economic distribution and cost management system.

This has already been set up for potato farms in Northern China, and can also work for egg producers. In China, most egg producers are located near one another in communities all over the country. Each farm handling anywhere from 1,000-10,000 birds.

Bringing these local units in to one larger base in each region can hugely benefit the overall economy.

Handling and packing

Regulating shell eggs is the first step towards industrialisation. There are very large differences in the level of grading found in Asia, ranging from 0 in a country like Indonesia to being almost a prerequisite in a country like Malaysia. Grading and packing can be done on a large range of machines with different capacities and differing ranges of automatic detection.

In grading it is important to have as little handling of the egg as possible to minimise straining the eggs, while also employing detection systems either automatic or manually. The main detection systems include, uvc, crack, leak, dirt and blood detection.

At the farm and individual shed site, it is common to either have a farm packer or to connect the automatic collecting system to a conveyor system, delivering the eggs directly to a grader.

Further processing

Raw material egg accounts for 80% of all costs in a processing plant, every last drop is money. Gentle cracking and correct opening along with gentle handling of the yolk and white are imperative for reaching the highest yield.

Breaking by centrifuge is banned in most industrialised nations, due to the contamination and risk factors which diminish the safety and quality of the end product.

According to international standards and international end users eggs must be broken by approved egg breaking and separating systems, with the possibility of removing contaminated eggs from production.

Centrifuges offer highest yield, however, quality and safety are severely diminished. The centrifuge tears apart the proteins of the egg white and homogenises the yolk and white. Important functions of the white (such as binding) are severely minimised by centrifuge, with diminished functions, more product is needed to perform the same task, adding to end costs.

Bacteria is highly concentrated on the shells, by processing with a centrifuge, the liquid egg comes in to direct contact with the outer shell contaminating the liquid product, highly increasing the bacteria count and, thus, reducing the end shelf life and quality.

Therefore, a safe and clean opening of the egg shell, by special knives and holders, is crucial to allow a safe and uncontaminated draining of the liquid egg.

USDA regulations demand that all eggs for human consumption are washed. This rule is being discussed in Europe and in China. Washing is a government regulation in Taiwan.

Accounting for 80% of the costs, the egg is the most important factor in any processing facility, being grading or further processing.

Gentle handling from the laying hen to the end product is crucial. Correct farm management, handling and control of the birds, transport of eggs from the farm to the grading centre and egg processing facility are

Continued on page 29

Continued from page 27

key. In the egg processing facility gentle loading and washing diminishes the loss of eggs.

Correct breaking methods, by gentle cracking, opening and handling of the egg through delivery of the liquid to individual cups further increase yield. Equipment for handling the liquid after breaking further needs to be manufactured with the final quality in mind.

Piping is imperative, with clean connecting points and welding, to reduce the build up of egg in the pipes, which is a feasting ground for bacteria. Filtering and cooling should be correctly designed for the handling of liquid egg.

Correct pasteurising on a dedicated egg products pasteuriser, with the ability to heat treat and handle the high viscosity of eggs and thoroughly handle the product without destroying the functions, is essential.

For instance, a dairy/milk pasteuriser cannot correctly pasteurise eggs, without destroying the important functions of the egg.

Further important equipment includes storage and holding of the liquid in tanks that retain the freshness of the product, to filling systems and box spray driers specifically built for the drying of liquid eggs and finally, specific cleaning systems (CIP) for the complete cleaning of the entire plant and all equipment. These are all imperative for gen-



Grading and packing can be done on a large range of machines.

erating the highest yield and best quality end product. In industrialised nations, egg producers work together on several fronts, particularly marketing and educating the market.

Established organisations such as the International Egg Commission, American Egg Board and The Canadian Egg Marketing Association, are comprised of individuals and corporations meeting several times per year to discuss the market situation and new policies.

In Asia the current key end users of processed eggs are largely the international food companies, with experience in using safe egg products. The domestic markets still need to understand the many benefits of purchasing egg products from dedicated egg products producers.

One avenue for this is for the egg products companies to work together in promoting and informing these benefits, ranging from safety, convenience and uniformity.

Consumer education

The industry should supplement the government's efforts to raise the awareness of consumers on their fair share of responsibility in ensuring that the food to be eaten is safe.

As such, the egg industry needs to work together to promote the egg and safe egg products. This has been the practice in the USA and EU for many years, with the American Egg Board in the USA and the International Egg Commission for the world.

These institutions work with the industry to promote the egg. Each country in Asia also needs an active industry voice, which on behalf of the industry will promote, market and educate both consumers, but also, the food industry to understand that safely processed eggs are of a higher quality and safe, convenient and easy to use.

Each company in this association will pay a percentage of their marketing budget to the association to finance the marketing strate-

gies, while also paying a reasonable membership fee to cover administrative costs.

The organisation could be set up similar to the American Egg Board which consists of 18 board members and 18 alternates from all regions of the country. All are egg producers nominated by certified state and regional organisations representing egg producers. The Board is appointed by the Secretary of Agriculture. The AEB staff, a small group of dedicated professionals, carries out the programmes under the Board direction. Something similar could be established in each country in Asia and, thereby, create a stronger voice for the industry to each and every producers benefit.

Paradigm shift needed

The egg industry needs a paradigm shift in thinking and approach to meet the multiple challenges. The 'industrialisation of nature' has changed the paradigm from quantity of food to the safety of food.

The rapid technological advances have led to new types of food, new processing technologies as well as new foodborne chemical and biological hazards that are constantly changing.

All stakeholders must keep up to date, share information transparently, collaborate effectively and take sensible reasonable steps to protect the safety of consumers.

Industrialisation now dominates every link in the food chain, from the manufacture of seed to processing, preparation and packaging for the supermarket shelves and industrial food product manufacturers.

New egg brands and products are becoming more and more commonplace in the retail outlets around the region.

Several new egg handling companies and further egg products processors are now bringing new measures to the industry and market and with this are creating brand names, which reflect higher standards of operation, from sorting (grading) to further processing. ■