

## MEAT PRODUCTION AND CONSUMPTION IN DEVELOPING COUNTRIES IN ASIA AND THE PACIFIC

Gunter Heinz, Livestock Section  
FAO Regional Office for Asia and the Pacific, Bangkok, Thailand  
and  
Anthony Bennett, Animal Production Service  
FAO Rome, Italy

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### Abstract

Problems of the meat industries in developing countries are not widely discussed at international meat sector reviews and meetings. However, continuing growth rates in meat production and consumption, in particular in Asia, require improvements in the meat handling and marketing systems. Specialized areas for livestock production must be developed in densely populated Asia. Technical, hygienic and environmental issues in the meat industry require urgent improvements. Ante-mortem treatment of livestock and meat sanitary issues need to be addressed. Technology transfer for the overall meat sector is desirable. The sustainability of the Asian meat sector involves also good management of feed resources and intra-regional monitoring of the animal health situation.

### Introduction

A few years ago a remarkable change took place in the world's meat sector. The annual meat output of developing countries exceeded for the first time the meat output of developed countries. This production trend has continued and the meat production gap continues to grow steadily.

Nevertheless, most publications on meat in meat journals with international distribution and also most papers presented during the ICOMST congresses in recent years refer predominantly to issues of meat quality, meat technology and meat hygiene in developed countries. The meat sector in developing countries is to a much lesser degree subject of publications, although there are considerable challenges which need to be urgently addressed.

It has to be realized that the situation in abattoirs and meat processing plants in the developing world is very different from that in developed countries and generally not satisfactory in terms of meat hygiene and handling practices. The only exceptions are a few developing countries who impose stringent regulations for their domestic meat trade or who possess export meat plants which have to comply with stringent requirements of the importing countries.

However, in the vast majority of developing countries the meat sector needs urgent improvement that can only be brought about through investment in infrastructure and trained personnel.

Shortcomings in infrastructure such as obsolete slaughter and meat cutting premises, unhygienic meat transport and meat sales and unprofessional further processing of meat are specific areas which need to be urgently addressed as a public health priority. At this stage due to the mentioned infrastructural problems it is in most places simply not possible to comply with HACCP requirements or impose stringent sanitary, residue or environmental regulations.

Despite all these obvious shortcomings the meat sector in Asian developing countries is booming. The world-wide highest growth rates in meat production and consumption in the last twenty years were recorded in developing countries in Asia. In the last ten years meat output in developing Asia increased annually by 9.2% compared to 3.6% in Latin America, 3% in the Near East, 2.2% in Africa and zero growth in the world's developed countries.

It appears that the Asian economic crisis which suddenly arose in 1997, has had so far only little impact on this trend. Apparently, consumers are cutting back on spending on luxury goods first and try to maintain their food intake habits. In many Asian societies this includes a significant share of animal protein food deriving from livestock or fish. Fish competes with livestock products, in particular meat. There are a number of countries such as Bangladesh, Indonesia or Vietnam where fishery products are comparatively cheaper than meat. However, in many other countries, in particular in the largest consumer market in Asia, China, meat is sold cheaper than fish and available at very competitive prices. A recent review in Shanghai revealed at traditional consumer markets average prices of US\$ 1.70 per kg pork, US\$ 2.70 per kg beef and US\$ 1.50 per kg chicken. Given the preference for meat,

in particular pork and poultry in East and South-East Asia, it is not surprising that there were staggering increases in the per capita consumption of meat, for example in China 10 kg in 1975, 25 kg in 1985 and 45 kg in 1998.

On the other hand there are some Asian countries like India and Pakistan, where another livestock product, milk, plays a more important role than meat in human diets, although the overall consumption figures of meat in those countries are comparatively high because of the high population in both countries.

South Pacific island states play only a minor role in meat production and consumption compared to Asian countries. However, the problem of these island states is that livestock production is restricted due to limitations of local feed production and the need of importing feed for intensive livestock production. Thus many of these countries prefer to import meat, however, with the consequence that considerable amounts of foreign exchange revenues have to be spent on those imports. Long term strategies in the agricultural sector are therefore to establish sustainable local livestock and meat industries.

### *Increase of meat supply in population centres*

In Asia as well as in other parts of the developing world the main increase in demand and consumption of for meat takes place in the rapidly expanding large cities. This is due to the population growth and migration into these cities and the relatively higher incomes earned there.

Development of these megacities is decisive for the future structure of the meat industry of a country. The emergence of Western style supermarkets in many Asian developing countries with sections for chilled and frozen meat and great varieties of processed meat products demands certain preconditions regarding slaughtering, meat cutting, storage and transport of meat. In contrast to the supply of the traditional meat markets the supply of a variety of meat cuts/types in supermarkets, requires some basic infrastructure, in particular refrigeration.

The market share of meat sold through supermarkets under a cold chain will certainly substantially increase. This will become the most efficient way of supplying the existing and future megacities with meat and meat products as the marketing channels between slaughterhouse and sales point to the consumer are lengthened. The traditional meat marketing systems with slaughtering during the night and meat sales through the so called "wet" markets a few hours later, will gradually decrease or in some places completely disappear mainly because the distribution chain becomes longer and more time consuming. Unrefrigerated meat marketing would then become very risky and pose a significant hygienic hazard. Presently many consumers in Asian countries still prefer the unchilled meat from the wet markets as it is in many cases cheaper and is perceived by consumers as having a better taste. However, the first steps to promote supermarket meat have already been taken in Shanghai and other cities in China. Hygienically packaged chilled meat was sold at supermarkets at a lower price than in the wet markets, resulting in an immediate change of preference by consumers away from the unhygienic wet markets.

Meat marketing in Asian developing countries may be categorised as follows:

- Practically traditional marketing only (in some least developed countries)
- Traditional and modern marketing (in the majority of the countries)
- Practically modern marketing with cold chain only (e.g. in all larger cities in Malaysia)

Traditional meat marketing systems are still popular and will remain widespread in Asia over the years to come. This is not because the consumers prefer this system but because the required infrastructure of these systems from the abattoir to the meat sales point is primitive and cheap, and benefits primarily the well established meat dealers and wholesalers. The consumer may in some cases also benefit through a relatively cheap price, but is compelled to buy meat of inferior hygienic quality.

A number of shortcomings typical for the Asian meat industries, but also typical for other developing regions in the world, are a consequence of the traditional meat marketing systems and its primitive infrastructure. A change to modern meat marketing implies the elimination of a number of associated problems of this marketing system. The main constraints are listed and discussed hereunder:

### *Relocation of livestock production and processing*

In traditional meat marketing systems, meat animals, in particular the short-cycle monogastrics (pigs and poultry), are raised and slaughtered near the consumption centres in order to keep the time span for "hot" (unchilled) meat marketing as short as possible. However, industrial or semi-industrial production of pigs and to a lesser extent also poultry, create tremendous environmental problems in suburbs or residential areas. Many cities in Asia have plans to phase out in particular pig production and have identified specific areas outside the city boundaries where in future this kind of livestock production will take place. In the long term the slaughtering and meat handling is planned to be carried out at the same location. All these changes in the animal production sector will imply that the traditional meat marketing has to be replaced by more modern approaches including hygienic slaughter, provision of continuous cold chain and suitable transport facilities. FAO is carrying out studies and supporting national seminars in Asian countries where guidelines for government and provincial authorities are established for the relocation and improvement of livestock production and processing.



## *Upgrading of slaughter facilities*

In many places in Asia the abattoir sector is neglected and will require much more attention in the future. This is not a uniquely Asian problem but refers to all developing regions. Fortunately, in Asia things are moving in the right direction in many places, for example in China a number of functional medium to large-scale abattoirs, mostly for pigs, either as state or government enterprises or joint ventures in the private sector have implemented real improvements. Thailand has built modern abattoirs for pigs and cattle with Government funding and is now encouraging the private sector to utilize these premises. This move has to be seen in the context of expected meat export possibilities to overseas markets, where the recipient countries have imposed stringent sanitary requirements. In some other Asian countries like the Philippines, Indonesia and Malaysia the private sector is also becoming more and more involved in the abattoir sector.

However, there are other countries where city abattoirs were built through external development programs. In many cases highly technically advanced equipment was introduced. National staff were not adequately trained in sustainable long-term abattoir and processing operations. This coupled with excessively high-energy costs and lack of spares etc. meant that many had a very short working life.

For slaughterhouse development projects FAO can provide model designs for abattoirs of different size and capacity. FAO is also planning to build together with the local authorities a small model slaughter facility in Vietnam. Appointed staff will be given detailed intensive hands-on training in slaughter operations. This facility can also be used for training courses in slaughter technology and hygiene.

## *Environmental aspects related to slaughterhouses*

Most abattoirs in developing countries have difficulties in treatment and disposal of abattoir wastes. This refers in particular to large outdated city abattoirs which are usually slaughtering far over their original design capacity and are disposing of solid wastes and effluents into nearby rivers, lakes, etc. It also applies to small rural abattoirs where waste is usually dumped without treatment on the abattoir site. In both cases the slaughter plants cannot afford mechanical, chemical or biological waste treatment facilities. It has recently been shown, that biogas digestors can improve the situation, at least in tropical climates where these digestors work very satisfactorily over many years without any energy or material inputs. Construction costs for biogas plants are low. Practically all solid and liquid abattoir wastes (except pig hair) can be digested without harmful residues or smell.

FAO is involved in the construction of a prototype biogas plant at a medium size abattoir in Thailand, which will serve as a demonstration and training facility for the Asian region.

## *Treatment of livestock prior to and at point of slaughter*

Improper handling of livestock does not only cause unnecessary suffering of animals but also losses of meat and by-products. Transport facilities are in many cases inadequate, for example cattle or buffaloes packed on too small trucks or pigs transported and kept waiting for hours in individual crates, which do not allow any movement of the animals or access to drinking water.

The killing of livestock is frequently done without proper stunning. This is due to the unavailability of suitable stunning equipment. It should be noted that even under Halal slaughter conditions, certain pre-stunning methods (such as electrical stunning or non-penetrative captive bolt stunning) can be acceptable.

In many places the stunning of pigs is carried out by knocking a group of animals unconscious by using a hammer or of cattle/buffaloes by stabbing with a pointed knife into the neck (medulla oblongata). Both methods inflict a great deal of pain and distress to the animals and are inhumane.

FAO in cooperation with International Non-Government Organizations (NGOs)/Animal Welfare Organizations provides demonstration stunning equipment (captive bolt pistols and electrical tongs) to selected abattoirs and organizes the supply of cartridges. These activities are to encourage a more wide-spread use of stunning methods in the respective countries. A brochure on Humane Treatment of Slaughter Animals is also jointly being prepared by FAO and NGOs.

## *Sanitary control*

Short-comings in sanitary control are a common feature in abattoirs and meat plants in developing regions worldwide. Veterinary services in many countries do not have enough personnel, transport facilities and specialized knowledge to adequately inspect all livestock slaughtered. The spread of zoonotic or animal diseases can be a consequence.

FAO organizes Regional Meat Inspection Training for Asian and Pacific Countries. Representatives of Veterinary Services of participating countries receive for one month combined theoretical and practical training in modern meat inspection in one

advanced country of the region. This shall enable and encourage countries to establish their national meat inspection programmes by using the graduates of FAO training courses as core instructors for national training.

### *Residues in meat*

Consumer protection is not high on the agenda in Asian developing countries, because there is not much public awareness and a lack of relevant laboratory facilities and manpower trained in residue testing. There are not only illegal veterinary drugs or too high levels of environmental contaminants (pesticides, heavy metals) which cause concern but potentially toxic substances used as illegal meat preservatives (e.g. borax).

Thailand has set up some regional laboratories to be used for food control and FAO assists with training in this field. The FAO Regional Meat Inspection Training will also include a component on residues in meat, residue testing and standards.

### *Meat grading and further processing*

In the traditional meat marketing systems there is not much scope for meat grading, i.e. most carcass parts are sold indiscriminately at the same price. In contrast, meat grading is the production and sale of valuable and less valuable carcass parts including those meat cuts which are best suited for further processing. This system benefits producer and consumer alike and is being increasingly applied in the Asian meat industry.

Apart from the traditional Asian processed meat products it also enables the processing of Western style processed meat products which are becoming increasingly popular on many Asian countries. Further processing of meat offers the chance of fully utilizing all edible carcass parts for human nutrition and to produce low-cost, value-added and/or shelf-stable meat products.

FAO is implementing programmes in various Asian countries to develop low-cost meat products for low-income population groups who cannot regularly afford meat. Furthermore, development work on shelf-stable meat products which can be stored under ambient conditions is being carried out. Regional Training Courses on Low-cost and Shelf-stable Meat Products are currently being organized by FAO with China acting as the host country.

### *Future development of the Asian meat sector*

The growth rates in the developing Asian meat sector are unparalleled in the world. This will require additional and faster development of the technical infrastructure and manpower training in the meat sector. Donor organizations are making substantial inputs, but more initiatives must come from individual countries. In many places the role of the private sector is strengthening which appears to be a good sign for the further upgrading of the meat industries. The private sector will also be in the best position to adopt new technical developments such as new and improved processing methods, additives and innovative products.

If the livestock sector is to supply meat animals to meet rising consumer demands, structural reforms and relocation of livestock production to rural areas will be needed. New approaches to livestock feed production will also be necessary, in particular to guarantee the availability of sufficient animal feed for the supply of expanding population centres with livestock products. Of particular interest for Asia may be the better utilization of buffaloes as meat animals. Buffaloes can be kept in marginal lands and can be raised on modest feed resources.

The animal health situation must be closely monitored in intra-regional cooperation of veterinary authorities. Foot and mouth disease and swine fever are endemic in the region. However, the region cannot afford major outbreaks of these diseases or others such as Rinderpest, Newcastle disease, etc. as this could destabilize the up to now well functioning supply systems for livestock and meat in Asia.