

# **The Current Situation of Feedgrains and Feedstuffs in Selected Asian Countries**

Young Kun Shim\*

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## **I. Introduction**

In the developing Asian countries, food consumption patterns and attitudes have changed as population and incomes increase. The trend is toward western dietary patterns with higher consumption of animal proteins to supplement the traditional cereal staples. This results in an increasing demand for meat and livestock products and a shortage of supply to cover market demand for such products under the traditional production systems. Accordingly policy-makers are now trying to formulate efficient measures to cope with livestock product shortages.

Many governments in Asia have undertaken a special programs including institutional loan arrangements for livestock farmers, exemptions for the import of livestock and feed, distribution of young animals on a credit basis, exemptions for raising animals, leasing public lands for pasture, and so on.

Due to promotional policies for increasing the number of livestock at the farm level, there has been some production increase. However, other problems such as the shortage of feedstuffs have emerged. Taking into account the high man-

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\* The author is Professor of Agricultural Economics, Seoul National University.

land ratio, the shortage of foodgrains, and low productivity levels, potential for the production of feedgrains, fodder crops, and pasture in most Asian countries does not look promising.

To satisfy Asian consumers' consumption preferences, it would be desirable to import many agricultural products including sufficient amounts of feedgrains, feedstuffs, livestock products, meat, etc. But the lack of foreign exchange prevents such an import policy. In the foreseeable future the Asian situation will in all likelihood be characterized by a chronic demand-supply gap for livestock products.

Thus far little information has been available to quantify the situation. In order to identify sectoral problems, the FAO has assigned nine consultants to write up country reports on production, utilization, and trade of feedgrains and feedstuffs. Since there was not sufficient data available for a general overview of the current situation, these consultants' reports were very valuable in terms of identification of the relative positions of the livestock industry in the countries studied.

This paper is based on the FAO reports prepared for the following countries: Australia, India, Indonesia, Japan, Korea, Malaysia, the Philippines, Sri Lanka and Thailand. It is designed primarily to compare the current status, the problem areas, and the possible prospects for the livestock industry in each country. Although this paper represents a first attempt at a comprehensive analysis using the FAO country reports, other supplementary data may exist which would improve its quality. We are basically trying to outline some policy issues requiring attention in the future.

## II. Production

Previously, the FAO estimated the available resources and the possible roughage production increases for Asia and Oceania. This report indicated that there were 800 million ha. available for permanent pasture use, 900 million ha. of

sparse grazing land, an indeterminate area for fodder crops, 320~370 million tons of paddy, wheat, barley and oat straw, and 40 million tons of rice hulls.

However, these figures have little meaning for Asia since over half of the possible permanent pastures are located in the developed countries of Australia, New Zealand and Japan. Thailand, the Philippines, Malaysia, Sri Lanka, Korea and Indonesia, i.e., the main part of Asia, do not have sizable permanent pastures, but must utilize wild grass on hillsides, the fringes of jungle, grasses underneath permanent tree crops, and fringes of cultivated land and roadsides for the grazing of very small herds. In addition, this area of natural grasses is contracting due to urgent alternative use demands. So, most Asian developing countries lack the resources for fodder production, and are now experiencing steady decreases in unimproved grazing areas.

Among the feedstuffs, cereals such as sorghum and maize are the most important for livestock production. Australia and Thailand are the major producers and exporters. India, Indonesia and the Philippines are the major producing countries and are nearing self-sufficiency. Total production in these countries, however, fluctuates by as much as 20~30% per year. Korea is a minor producer and major importer regardless of domestic production. To increase production of feedgrains, most countries have set up some special programs. Malaysia has a subsidy program to encourage paddy farmers to grow maize and sorghum during the dry season in single-cropped paddy areas, and rubber and oil palm planters to intercrop their holdings. The policies in India, the Philippines and Korea combine input subsidies with price supports for the coarse grains to a certain degree. But in general these measures have had limited impact on increasing feedstuff supplies because of limited budgetary resources, lack of an effective extension service, and an inefficient distribution network. In addition, farmers have a low level of purchasing power and little incentive to improve their farming practices or productivity. For instance, the Thailand maize and the Indian sorghum programs were unsuccessful due to the insufficient input subsidies and price support programs. In recent years,

Thailand has increased maize production greatly owing to assured export markets providing remunerative returns. In India, there was an increase in production of sorghum due to the expanded acceptance of sorghum as food in some states. In general the production shortfall of coarse grains is likely to continue as FAO data show that output is expected to grow at the rate of 2.4% while demand expands by 4.4%.

Cereal milling by-products from rice, wheat and barley constitute the second major category of feedstuff concentrates in the countries studied. Since brans come from the milling process of grains, the available quantity depends largely on the quantity milled. Even if we assume that cereal production will be increased by 2~3% per year on the average, the production of bran would increase at the same rate. Production of brans at this rate in most Asian countries will assure that they are used mainly for domestic purposes, as there appears to be little potential for future bran exports. At this time, India exports deoiled rice bran under the support of a government subsidy but restricts the export of wheat bran. Thailand also exports only deoiled rice bran.

Oilseed cakes and meals made from coconuts, soybeans, groundnuts, rapeseed, sesame, cottonseed and linseed are produced in most countries for livestock feed. There are several exporting countries including India, the Philippines, and Indonesia. But the region as a whole is short because of massive net-imports by Japan, Malaysia, and Korea. Total exports can not cover the quantity to be imported in the region. FAO estimates that between 1972~74 and 1978, the production of coarse grains increased by 2% while consumption rose by 4% in Asia.

Roots and tubers produced in this region are expected to keep pace with feeduse. In this regard, FAO estimates that some 38 million tons of roots and tubers or 26% of the total production was fed to animals during 1972~74. Projections for 1978 foresaw a 4.2% increase per year in production from the 1972~74 levels. The main root product used as feed is cassava produced in Thailand, India, the Philippines and Malaysia, and it is projected to grow at

1.8% per year for the decade 1975~1985 in these countries. Thailand has been the main surplus producer and exports cassava to Singapore, Hong Kong, Malaysia and western Europe.

About 27 million tons of pulses including beans, peas, chickpeas and lentils are produced mainly in China and India. Use of these pulses for feed is currently estimated at about 10 percent, and the growth rate of production was projected at 3.2% per year up to 1985. By-products from pulse milling are also important feedstuffs and are used primarily in India where output is estimated at 1.3 million tons, although those materials are apparently not used at the farm level.

Throughout these countries, sorghum, maize, cereal milling products, oilseed cake and meal, roots and tubers, and pulses are major feedstuffs. Total production however is not sufficient to cover animal production needs except in Australia and Thailand. There is going to be a greater gap between demand and production in the coming years.

### III. Utilization

Livestock feeds, particularly for poultry and hogs, have a high cereal base. Cereals form 40~65% of the compound feeds in Korea, Malaysia, Thailand, the Philippines, India and Japan. These are all cereal importing countries except Thailand, and it places a heavy burden on the grain resources of the country.

In some developing countries, the bulk of concentrate feedstuffs is fed directly to livestock without being compounded. For example, only 4% of concentrate feedstuffs in India and 20% in the Philippines is compounded by feedmilling industries to ensure balanced nutritional rations for livestock.

There is a serious deficiency of information on the feedmilling industry. Based on available but incomplete information, it appears to be the link in the livestock industry in most urgent need of development. At present, Japan and

Australia have the most advanced level feed mills with plant capacities which are usually large. A substantial proportion of their animal feed is in the form of compound feeds.

Japan, the leading compound feed manufacturer, produced 21.1 million tons in 1978 or twice the total amount produced by the 8 other countries studied. Since 1976, many Japanese mills have rationalized their production facilities through what is known as the "scrap-and-build" process.

Australia produced 3.4 million tons in 1978/79, of which 2 million tons came from commercial feedmills and the remainder from large livestock enterprises. In recent years, the Australian feedmilling industry built a number of new plants using North American and European concepts adapted to local requirements.

Korea, Malaysia, the Philippines, Thailand and India represent the second level of feed use technology. These countries have well established and rapidly expanding feedmilling industries.

Korea produced 3.3 million tons in 1978. It expects to expand output at the rapid rate of 12 percent. per year to reach 6.6 million tons in 1985 and 11 million tons by 1991. This fast expansion is being achieved through the construction of a number of large modern plants.

Indian mixed feed production, though currently at a relatively low level of 1 million tons, is expanding rapidly at 15 percent. annually.

The Thai feedmilling industry reported an output of 1 million tons in 1978. It expects to expand at a fast pace in the 1980's.

In Malaysia, mixed feed production is expected to double from 1 million tons in 1978 to 2 million tons in 1990.

In the Philippines, output in 1978 was estimated at 0.9 million tons. Conservative forecasts place the rate of expansion at 3~4 percent. per year reaching nearly a million tons in 1985.

In these countries, a few large companies with nationwide production and distribution networks dominate the market. They are the price leaders both in

the input and product market. There are also a large number of medium and small-sized producers about which little is known. In general, the smaller mills supply specific areas because of the locational advantages they enjoy. It is also common for large livestock operations which mix their own feeds to supply neighboring farms.

The least developed, third category of feedmilling industries are found in Indonesia and Sri Lanka.

Indonesia produced 0.2 million tons from 22 registered large and medium-sized feedmills. But there are many small scale village and home operations throughout the islands of which there is no documentation.

Sri Lanka produced 0.1 million tons from two government enterprises and one private feedmill. The bulk of livestock and poultry production in these two countries are village operations of the open range type. Supplementary feeds used are by-products of home or village cereal and oilseed milling. The serious shortage of foodgrains in these two countries is probably the main constraint to the development of a viable feedmilling industry.

Regardless of the level of feedmilling technology, all seven developing countries have common fundamental characteristics. To begin with, livestock feeding, particularly of poultry and pigs, is basically cereal-based. Cereals form 40 ~65 percent. of the compound feeds in Korea, Malaysia, Thailand, the Philippines and India. In Japan the cereal component of mixed feeds is two-thirds. Except for Thailand, these are all cereal-scarce countries.

Seven developing countries reported that 41 agricultural products and by-products were used to varying degrees in livestock feed. But among these feedstuffs, only 18 are what might be termed staple ingredients. This means that they are in regular supply and form the bulk of the compounded feeds.

These staple feedstuffs include: maize, sorghum, rice bran, wheat bran and pollards, tapioca, oilcake and meal of coconut, soybeans, groundnuts, repeseed, sesame, cottonseed, linseed, molasses, fish meal, meat meal and bone meal.

The feedmilling industries have not utilized the many available nonconven-

tional feeds for various reasons, including lack of technical know-how, irregularity of supply and difficulty of collection, preservation, and transportation to the factory. But some progress is being made.

The Philippines has successfully pioneered the utilization of Ipil leaf meal and is extending its use. In cereal-scarce Sri Lanka efforts are being focussed on developing compound feeds from combinations of jackfruit meal, rubber seed meal, sugar cane molasses and baggasse.

India has 10 non-conventional feedstuffs in various stages of developing including mango kernel, jamun seed, sunhemp seed, tobacco seedcake, salseed meal, mohua cake, tamarind seed, cassia tora seed and left meal, and Ambadi cake. These nonconventional feed resources are supplied by agriculture, forestry and industry.

There is a serious shortage of data on the structure, size-distribution and technological levels of the feedmilling industries in developing countries of the region. Usually information is available on medium and large size factories. In Malaysia, for example, feedmills employing less than 20 workers are not documented by any statistics office.

In India and the Philippines little data is available on those small and medium sized mills which are not members of the national feedmillers association. In Indonesia, data on small feedmills outside Java is almost nonexistent. This common shortcoming impedes progress in the solution of two very serious problems, namely under-utilization of plant capacities in the industry and quality control of the concentrate feeds in the market.

Under-utilization of plant capacities is a common characteristic of most feedmilling industries in the countries. Based on available but incomplete information on medium and large-sized mills annual output is only 45 percent of installed production capacity in Malaysia, 50 percent in Sri Lanka, 40 percent in India, 70 percent in the Philippines and 50 percent in Thailand. Only one developing country, Korea, makes maximum use of plant capacity.

Factors cited as contributing to such under-utilization of plant capacities in developing countries include: erratic demand for mixed feeds, particularly in



the pig sector, due to the cyclical nature of this business; the trend towards larger pig and poultry enterprises and development of self-mixing on the farm by these enterprises resulting in proliferation of mixing plants; market limitations due to high transportation costs, and production limits imposed by government regulation and/or due to shortages of feedstuffs because of foreign exchange constraints limiting the import of ingredients.

A number of countries reported difficulties of quality control. There seems to be either absence of or incomplete legislation and lack of enforcement of existing regulations.

Taking the quality problem a step further, it is clear that in many developing countries feedmillers have adopted ration formulations developed in temperate climates. There has been too few tests on whether these ration formulations meet nutritional requirements of livestock for optimal performance under local climatic conditions. Thus, even if quality standards of feeds are enforced, there is no guarantee that they are the best for the country.

Although it is not widespread, the adoption of official or unofficial measures to restrict expansion of factories or establishment of new factories has been reported.

In one country, the government has decided that poultry feed manufacture should be carried out by small-scale, rural feedmilling factories. Existing large factories are given quotas based on their past performance. No new large poultry feed factories can be set up. In another country, the bulk of the compound feed is produced by government feedmills not because the government has a competitive edge over the hands of government agencies. What effect these developments have on the livestock industry in the medium and long-term has to be carefully analysed.

#### IV. Trade

The production shortfall of concentrate feedstuffs in the countries has neces-

sitated substantial imports.

Japan is the leading net importer. It takes nearly two-thirds of the total imports of countries of the region. Malaysia, Korea, and the Philippines have emerged as significant and fast expanding net importers. Sri Lanka and Indonesia are also importers of coarse grain and oilcakes and meals though the level of imports are erratic.

Only two countries—Australia and Thailand—are major exporters of coarse grains, and three countries—India, Pakistan and the Philippines—are significant exporters of oilcakes and meals.

Overall, regional country imports of coarse grains tripled during the 1960's. This rose at the rate of 7 percent. in recent years to reach 25 million tons in 1978. Imports of oilcakes and meals expanded even more rapidly at 14 percent. annually in recent years to reach three million tons of protein equivalent in 1978.

These rising imports of countries of the region must be seen in the context of the overall regional shortage. Normally, over 80 percent. of coarse grains and 90 percent. of oilcake and meal imports of deficit countries of the region come from outside the region. The major source of both coarse grains and oilcakes and meals is the United States, with irregular supplementary supplies coming from Canada, Argentina and Brazil.

The share of intra-regional trade is very small. It amounted to only 2.3 million out of 22.8 million tons of coarse grains in 1977/78 and 0.1 million out of 2.5 million tons of oilcakes and meals in 1977. This low-level of intra-regional trade in a situation of massive and fast expanding imports into the region suggests a potential for increasing trade between countries of the region.

But there are a number of constraints. These include: lagging production and increased domestic use of feedstuffs in exporting countries; traditional trade links which are difficult to change; unfamiliarity of major importing countries with some feedstuffs produced in the region; tariff and non-tariff barriers; and availability of feedstuffs at low costs from surplus producers outside the region.

Exports of 4.5 million tons of coarse grains and one million tons of oilcakes and meals from countries of the region have shown little growth in recent years. The main constraint is fluctuating harvests and increased domestic uses of these commodities. In 1977/78, for example, exports of coarse grains declined by one-third following poor 1977 harvests of maize in Thailand and barley in Australia.

Output of major oilseeds like groundnuts in India has remained static, though domestic use of the oilcakes and meals have increased. Vulnerability to changing weather conditions of crops mostly grown under rainfed conditions, and fluctuating prices on the export market have contributed to this situation.

Traditional trade links between Asian exporters and European importers also serve to limit the growth of intra-regional trade. Proximity, ease of shipping to European ports, established and reliable trading partners and payment in needed currencies have all served to channel the greater part of India's groundnut cake and meal, and the Philippines' shipments of copra to Western and Eastern European ports. Over 90 percent of Thailand exports of 5 million tons of tapioca pellets also go to Europe as there is little demand within the region. On the other hand, Japan and Korea's trade links are the U.S., Canada and Australia. This means that there is little inter-Asian trade.

Sometimes, manufactures are unfamiliar with certain feedstuffs in large supply within the region. The limited use of tapioca to replace cereals by major feedstuff importing countries, and the preference for imported rather than locally manufactured fishmeal are cases in point.

Imposition of import and export duties on certain feedstuffs in some countries has also served to restrict trade in feedstuffs. Thailand has export duties on maize and tapioca and until recently banned exports of compound feeds. Malaysia has a five percent surtax (ad valorem) on eleven feedstuffs and levies a tariff of five percent on prepared feed imports. There is also a five percent export duty on finished feeds. Japan practices a very complex system of basic, conventional and provisional import tariffs and quotas on 33 imported items of

feedstuffs. And India combines export duties, export bans on some items and export subsidies on others. These are only some of the examples of tariff and non-tariff barriers to trade. They undoubtedly have some negative impact on intra-regional trade though the extent is not fully understood.

Finally, the easy availability of feedstuffs, particularly coarse grains often purchased at remunerative aid-oriented prices from outside the region, serves to undercut intra-regional trade further. Prices of the U.S. maize to developing countries of the region are often cheaper and always of better quality than from countries within the region. Besides, the more effective trade promotion activities of the U.S., particularly in Japan and the Republic of Korea, have had a very significant positive effect.

## V. Conclusion

The shortage of feedstuffs production in most Asian countries is expected to continue and thus more imports are required to expand the livestock and poultry industry. The previous trade linkage has not been based on intraregional ties. Feedstuff exports from Thailand, the Philippines and India have been shipped to west European countries. On the other hand, the major importing countries such as Japan, Korea and Taiwan receive their supplies from other western countries including the U.S., Canada, and Australia. Thus the developed countries outside Asia remain the primary importers and exporters of feedstuffs. As a result, intra-regional trade is very small in spite of the very rapid growth rates of imports in the region.

The feedmilling industries in most countries, except Japan, Australia and Korea, are not efficient. Feed compounding is over-dependent on cereals such as sorghum, corn and soybean cake and meal. The main reasons for under utilization of plant capacity is that demand for compound feeds is seasonal, markets are limited, severe price fluctuations occur, prices are controlled by the governments, a supply shortage of raw materials often exists, there is a

lack of technical know-how and so forth.

The response of many developing countries to these serious problems of production, milling and trade difficulties has not been encouraging. They have neither taken concerted national action nor exploited positive developments in neighboring countries.

In the future feedstuffs will continue to be regarded as agricultural by-products and wastes rather than as the final products of crop production. There are four major reasons for this view.

First, most developing countries do not have policies and programmes specifically directed toward the development of feedstuffs. Where they exist, such policies and programmes are subsidiary to food production objectives, which sometimes make them inconsistent with livestock production aims and thus usually produce ineffective results. Efforts at formulating sound policies and programmes are hampered by the lack of basic and current statistics. There is clearly a need for developing countries which do not already have sector plans to draw up integrated, target oriented policies and programmes for feedstuffs. And their plans should harmonize with those of countries they trade with or intend to trade with in the region.

Second, most developing countries have not fully utilized the many nonconventional feedstuffs available in the region. This is because insufficient effort has been put into developing the technology and the logistics of non-conventional feedstuffs for their profitable inclusion in feed compounds. A complete understanding of all conventional and non-conventional raw materials locally available for feed compounding together with a knowledge of their seasonal availability, composition, and interchangeability is very important.

Third, the feedmilling industry has been left to the private sector in countries of the region. Except for Japan, Australia and the Republic of Korea, there seems to be little industry planning and regulation. There is an urgent need for the feedmilling sector, the livestock sector and the government to get together to coordinate developments in the industry, particularly with respect

to conservation of feed resources, production capacity, and quality control.

Fourth, little effort has been made to increase intra-regional trade. Most countries continue to impose import duties, quotas and restrictions on feedstuffs, and to rely on traditional trade links with countries outside the region for their supplies. A complete understanding of the potential for intra-regional trade and the means for its realization is needed.

To ensure sustained growth in livestock and poultry production at minimum costs and without the uncertainties associated with dependence on imported feeds, it is imperative that the above four inadequacies be remedied. Initial action might lie in setting up a national study group on feedstuffs and livestock production for those countries which do not yet have them.

The study group would monitor developments in the feedstuffs and livestock feeding sector, recommend policies and programmes to the government, and review periodically the impact of these policies and programs. It would report to the main government agency responsible for livestock development.

Most developing countries in the region face essentially the same problems. Differences are only a matter of degree. Therefore, it might be worthwhile to establish a cooperative research team with members from all interested countries to promote information exchange on basic and current statistics, technical cooperation, and trade.

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