Goat Meat Production in Asia

Proceedings of a workshop held in Tando Jam, Pakistan, 13–18 March 1988
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Abstract/Résumé/Resumen

Abstract: This publication presents the results of a workshop held in Tando Jam, Pakistan, 13–18 March 1988, that focused specifically on all aspects of goat meat production in Asia. The workshop addressed the factors affecting meat production (breeding, nutrition, reproduction, sex, management, animal health, and diseases), the nutritional value of goat meat, methods of slaughter, processing techniques, consumer preferences, and the national and international marketing of goats. The detailed discussions on these aspects were further highlighted by country case studies, prevailing situations, issues and policies, and potential for improving the prevailing patterns of production. An important session covered broader issues concerned with research and development, strategies for increasing production, and export potential, especially in Near East markets. These discussions enabled a definition of research and development priorities and the scope for increasing goat meat production.

Résumé: Cette publication fait le compte rendu d'un atelier tenu à Tando Jam, au Pakistan, du 13 au 18 mars 1988 et qui a porté sur tous les aspects de la production de la viande de chèvre en Asie. Il y a été question notamment des facteurs influant sur la production de la viande (sélection des espèces, nutrition, reproduction, sexe, gestion, santé animale et maladies), de la valeur nutritive de la viande de chèvre, des méthodes d'abattage, des techniques de transformation, des préférences des consommateurs et du marketing national et international des chèvres. En plus de discuter de ces questions en profondeur, les participants ont aussi abordé les points suivants : études de cas de certains pays, situations actuelles, enjeux et politiques, et possibilités d'améliorer les tendances actuelles de la production. Lors d'une séance importante, les participants se sont penchés sur des questions plus vastes concernant la recherche et le développement, les stratégies qui permettraient d'augmenter la production et les possibilités d'exportation, particulièrement vers les marchés du Proche-Orient. Ces discussions ont permis de définir des priorités en matière de recherche et de développement et de déterminer le potentiel de croissance de la production de la viande de chèvre.

Resumen: Esta publicación contiene los resultados de un taller celebrado en Tando Jam, Paquistán, del 13 al 18 de marzo de 1988, dedicado específicamente a todos los aspectos de la producción de carne de cabra en Asia. El taller estudió los factores que afectan la producción de carne de cabra (cruce, nutrición, reproducción, sexo, manejo, salud y enfermedades), el valor nutricional de la carne caprina, los métodos de sacrificio, las técnicas de procesamiento, las preferencias del consumidor y el mercado caprino nacional e internacional. Las discusiones detalladas sobre estos aspectos se vieron además enriquecidas con el potencial para mejorar los patrones prevalentes de producción. Una de las sesiones importantes cubrió los aspectos más amplios de investigación y desarrollo, estrategias para el aumento de la producción, potencial de exportación, especialmente en los mercados del cercano oriente. Las discusiones permitieron determinar las prioridades de investigación y desarrollo así como las posibilidades para aumentar la producción de carne caprina.
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Goat meat production in Nepal

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Abstract: Goat meat is consumed by all the communities of Nepal and is constantly in high demand. With a price rise of about 300\% over the last decade, goat meat production has become an important means of income generation. The possibilities of expanding goat meat exports to India and goat skin exports to overseas markets further emphasizes the importance of goat production. A lack of marketing facilities (storage, slaughterhouses, and distribution systems), however, retards goat meat production. Additionally, inadequate scientific research on breeding, feeding, management, and disease control contribute to the low production. A technology package on goat meat production, including economic aspects of production, is urgently needed. National and international concern is required to strengthen national programs.

Résument: Il se consomme de la viande caprine dans toutes les collectivités du Népal; la demande est élevée et constante. La hausse de prix d’environ 300\% qu’a connu la viande caprine au cours de la dernière décennie a fait de cette production une source importante de revenus. Les possibilités d’exporter plus de viande caprine vers Inde et de peaux de chèvres vers les marchés étrangers ajoutent de l’importance à la production caprine. Le manque d’installations commerciales (entrepôts, abattoirs et réseaux de distribution) retarde toutefois cette production. De plus, les lacunes dans les domaines de la recherche scientifique en élevage, de l’alimentation, des soins et de la lutte contre les maladies contribuent à la faiblesse de la production. La publication d’une série de documents techniques sur la production de viande caprine et ses aspects économiques est urgente. Le renforcement des programmes nationaux dépend de l’intérêt qu’on portera à ces questions à l’échelle nationale et internationale.

Resumen: La carne de cabra se consume por todas las comunidades de Nepal y tiene constantemente gran demanda. Con un alza de precios de aproximadamente 300\% durante la última década, la producción de carne de cabra se ha convertido en un importante medio de generación de ingresos. Las posibilidades de expandir las exportaciones de carne de cabra hacia la India y las de pieles de cabra hacia mercados extranjeros alentan la producción caprina. Sin embargo, la falta de instalaciones de comercialización (almacenes, mataderos y sistemas de distribución), retarda la producción de carne de cabra. Además, una investigación inadecuada sobre crianza, alimentación, explotación y control de enfermedades contribuye a una baja producción. Se necesita urgentemente un conjunto de medidas tecnológicas sobre la producción de carne de cabra, incluyendo aspectos económicos de la producción. Se necesita la atención nacional e internacional para fortalecer los programas nacionales.

Goats are raised by Nepalese farmers for meat, income, and religious purposes. They account for the highest population among meat-producing animals (20\%). The goat meat supply is about 10 times that of mutton, 5 times that of poultry, and 3 times that of pig meat. Because goats are raised for both family consumption and income generation, there is a growing interest in their production.

The price of goat meat has increased over 300\% in the last 10 years. In addition, hides and manure, the by-products of goats, have economic value. The 30\% increase in the goat population over the past 20 years is an indication of the farmers’ positive attitude toward this species. The demand for goat meat in Nepal
is high, resulting in over 70,000 animals being imported from India and China every year.

**Distribution of goats in Nepal**

Recent livestock statistics from the Department of Food and Agriculture Marketing Service, His Majesty's Government of Nepal, indicate that there are 4.9 million goats in Nepal (DFAMS 1985). The goat population is highest in the central development region (1.5 million) followed by the eastern development region (1.4 million) (Fig. 1). These two eastern regions possess about 60% of the total goat population but account for only 38.1% of the land area of Nepal.

West of the central development region, the goat population decreased (Fig. 1). The goat population density in eastern Nepal is 50.5 goats/km²; in west Nepal, 22.5 goats/km². Proportional to the goat population, the goat meat production was higher in eastern Nepal (52%) than in western Nepal (48%). The goat population is closely associated with the human population (Fig. 1).

**Breeds of goats**

The moderate body size, slow growth rate, poor milk-producing ability, and high prolificacy are some characteristic features of Nepalese goats. There is wide

![Area, Goat meat, Goat population, Human population](image)

**Fig. 1.** Distribution of goats, humans, and goat meat production in different development regions of Nepal: 1, eastern; 2, central; 3, western; 4, midwestern; 5, far western. Development regions 1 and 2 make up east Nepal and development regions 3–5 make up west Nepal.
genetic diversity within local goat populations because of their adaptation to high altitudes, mid-hills, and terai and the influence of foreign breeds. The local breeds that are identified on the basis of topographical adaptation are Changra, Sinhal, Khari, and Terai. Among these four breeds, Khari (hill goats) is the main breed (56.2%) followed by Terai (27.2%), Sinhal (15.6%), and Changra (1%).

Khari has a moderate body size ranging from 27 to 40 kg. One of the prominent characteristics of this breed is its high prolificacy of 1.83 (Pradhan and Gurung 1985). Sinhal is commonly found in the wet, cold regions of the transitional zone in the high hills. Unlike the Khari breed, Sinhal is not as prolific, producing only 1 kid/year, and is marked by seasonal breeding behaviour. In a survey study of Sinhal goats, Karki (1984) found that 90% of kidding took place from October to March; the remaining 10% occurred from April to September. Most fertile conceptions occurred in the rainy, moderately cooler season (July to November), especially from September to November. Changra has long hair, curled horns, is found at high altitudes, and is mostly raised in transhumance systems along with sheep. This breed is useful as a pack animal and is famous for “pashmina” fur. Terai goats are characterized by a “Roman nose” and pendulous ears similar to the Jamunapari. Terai goats are also called “Lamkana” because of their pendulous ears. They are generally larger and produce more than other local breeds.

Feeding and management practices

The poor performance of the local goats is attributed to poor nutrition. In Janakpur, McTaggart and Wilkinson (1982) found that the growth rate of local goats was 100 g/day when they were fed berseem. When these goats were grazed in natural pasture, the growth rate dropped to 33 g/day.

Grazing in forest areas, tethering, or grazing in community pastures are common feeding practices in Nepal. The zero-grazing practice is not prevalent in the west part of Nepal, which has lower goat and human populations.

Smallholdings (0.2–0.3 ha) with small-scale goat production are characteristic of Nepal. Surveys in some districts of Nepal (e.g., Sharma 1982) gave an average of 0.41 goats/household. Homemakers and children take care of these goats.

Breeding and goat improvement

The genetic potential of local Khari goat is inferior to that of Jamunapari when growth rates are compared at two research stations (Table 1). To increase the production potential of local goats, His Majesty’s Government of Nepal established a central goat improvement farm in Bandipur (in the mid-hills) by introducing Jamunapari from India in the 1970s. Saanen goats were also imported from Israel to improve local goats by cross-breeding for milk and meat production at Khumaltar in the Kathmandu valley, also in the early 1970s. The Jamunapari appears to have spread more widely than the Saanen, producing crossbreeds with lower prolificacy and poor growth rates (Table 2).

Jamunapari goats have been noted to frequently suffer in the mountain regions because of their susceptibility to disease and their poor adaptability (Karki 1984). Researchers in Nepal now must determine which breed(s) can contribute significantly to the economic well-being of the country. The problems in
Table 1. Goat population and goat meat production in Peninsular Malaysia (1985).

<table>
<thead>
<tr>
<th>Study</th>
<th>Breed</th>
<th>Location</th>
<th>Adult body weight (kg)</th>
<th>Age (weeks)</th>
<th>Growth rate (g/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oli and Morel</td>
<td>Khari</td>
<td>PAC</td>
<td>-</td>
<td>15</td>
<td>50</td>
</tr>
<tr>
<td>(1985)</td>
<td>Jamunapari</td>
<td>PAC</td>
<td>-</td>
<td>15</td>
<td>50</td>
</tr>
<tr>
<td>Pradhan and</td>
<td>Khari</td>
<td>CGF</td>
<td>29</td>
<td>14</td>
<td>65</td>
</tr>
<tr>
<td>Gurung (1985)</td>
<td>Jamunapari</td>
<td>CGF</td>
<td>37</td>
<td>14</td>
<td>100</td>
</tr>
</tbody>
</table>

*PAC, Pakhriras Agricultural Centre, Shankuta, Nepal; CGF, Central Goat Farm, Bandipur, Nepal.

Table 2. Performance of local and Jamunapari x local goats at different locations in Nepal.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Local</th>
<th>Jamunapari x local</th>
<th>Sourcea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult body weight (kg)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandipur</td>
<td>40.3  (35)</td>
<td>44.4 (22)</td>
<td>1</td>
</tr>
<tr>
<td>IAASb</td>
<td>27.5  (25)</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Live weight at 6 months (kg)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandipur</td>
<td>13.3  (5)</td>
<td>16.1 (17)</td>
<td>1</td>
</tr>
<tr>
<td>Pakhriras</td>
<td>11.1  (23)</td>
<td>13.4 (9)</td>
<td>3</td>
</tr>
<tr>
<td>Growth rate (g/day)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandipur</td>
<td>66.0  (5)</td>
<td>79.0 (36)</td>
<td>4</td>
</tr>
<tr>
<td>Pakhriras</td>
<td>51.0  (73)</td>
<td>55.0 (13)</td>
<td>3</td>
</tr>
<tr>
<td>IAASb</td>
<td>45.0  (6)</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Litter size</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandipur</td>
<td>1.83</td>
<td>1.27</td>
<td>4</td>
</tr>
<tr>
<td>Pakhriras</td>
<td>1.68</td>
<td>1.45</td>
<td>3</td>
</tr>
<tr>
<td>Age at first kidding (days)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandipur</td>
<td>345</td>
<td>399</td>
<td>4</td>
</tr>
<tr>
<td>Pakhriras</td>
<td>460</td>
<td>630</td>
<td>3</td>
</tr>
<tr>
<td>Milk yield (L/lactation)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pakhriras</td>
<td>34.0</td>
<td>56.0</td>
<td>6</td>
</tr>
<tr>
<td>IAASb</td>
<td>28.0</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Khumaltar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hill goat</td>
<td>58.6</td>
<td>-</td>
<td>7</td>
</tr>
<tr>
<td>Terao goat</td>
<td>87.1</td>
<td>-</td>
<td>7</td>
</tr>
</tbody>
</table>

Note: Values in parentheses indicate the number of head observed.  
a1, Singh (1984); 2, M. Kharel (personal observation); 3, Oli, 1987; 4, Pradhan and Gurung (1985); 5, Dhakal et al. (1985); 6, Oli and Morel (1985); 7, Pradhan (1979).  
bInstitute of Agriculture and Animal Sciences, Rampur, Nepal.

goat improvement have arisen from faulty breeding practices and a lack of well-planned breeding programs. Poor breeding practices followed by farmers have been defined as "negative breeding" (Shrestha 1984). Usually, the best kids are castrated and later killed by butchers for meat. This reduces the number of breeding animals. The Department of Livestock Development and Animal Health has distributed about 250 locally selected bucks, mainly Jamunapari goats, to improve the quality of animals.
Some new problems

Some of the social changes in Nepal like family planning, new educational awareness, urbanization, new eating patterns, prohibition of meat by religion, etc., have contributed to changing livestock-raising practices. For example, family size has been reduced because of increased family planning and the labour of housewives and children, which was mainly responsible for the care of goats, has been decreased.

Moreover, because of people's educational awareness, they are sending their children to school, contributing to the reduced family labour strength. In addition, urbanization and industrialization have attracted many villagers to the urban areas. This situation, therefore, calls for some changes in management practices, e.g., stall feeding, programs for specialized farming, etc. From a survey of eastern Nepal, Oli (1985) reported that farmers who were previously practicing traditional grazing were now converting to zero grazing. This study also found that 42, 15, 14, and 29% of farmers were practicing communal, scavenging, migratory, and stall-feeding systems, respectively.

Marketing

Goats are marketed in a similar way to buffaloes (Upadhyay 1972). The largest goat markets in Nepal are Lahan (Udaipur), Shakhwa (Janakpur), Dubahi (Sunsari), and Sanischare (Jhapa). These markets are mostly located in the inner Terai and Terai belts. From these markets, the traders transport goats in flocks of 50–100 to Kathmandu, Chitwan, and Pokhara for sale (Fig. 2). It is estimated that 150 goats are slaughtered every day in Kathmandu. The wholesaler/traders or middlemen sell the goats either directly to the consumers or to butchers, who then sell dressed meat. Since there are no public slaughterhouses or

Fig. 2. The sale of goats in a Kathmandu market.
storage facilities, goat meat is always sold as red meat. Goats are also transported across the border into India. Nepal, however, imports more goats from India than it exports (Table 3). About 4% of the imported goats come from Tibet, especially at festival time. Nepal, however, does not export goats to Tibet.

Pricing and trading

There is no authorized price-fixing agency in Nepal; trading is done between buyers and sellers based on the bargaining system. Because of the lack of weighing machines, the assessment of body weight is arbitrary and subjective, based on lifting the animal and on dentition. Butchers slaughter goats using a knife to remove the head. The dressed meat is sold in kilograms; however, an older system, the dharni (2.3 kg), is also widely used in the high hill and mountain districts although the metric system has been enforced in Nepal since 1968.

Consistent with the increasing demand for goat meat, there has been a continuous rise in the price (Fig. 3). The price increased 200% from 1977/78 to 1986/87. The price of goat meat also differs from one region of Nepal to another (Table 4). The prices in the eastern and central development zones are moderate. This is probably due to the higher number of goats per human, better marketing, and better transportation facilities. The price of goat meat is highly correlated with the human to goat ratio.

Over the last 10 years (1977–1987) prices have been higher from October to March than from April to September. This could be due to the people's preference to eat more meat in the winter than in the summer. Also, the important festivals, such as Durga Puja, occur after the summer, increasing the demand for goats.

Problems

One problem faced by the goat-raising industry of Nepal is the inadequate market and marketing facilities. Inaccessible, distant markets, poor marketing

Table 3. Export and import of goats (x10^3) in Nepal from 1981/82 to 1984/85.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Export</td>
<td>63.5</td>
<td>56.3</td>
<td>38.2</td>
<td>61.3</td>
</tr>
<tr>
<td>Import</td>
<td>81.8</td>
<td>69.8</td>
<td>115.4</td>
<td>96.5</td>
</tr>
</tbody>
</table>

Source: Department of Customs, His Majesty's Government of Nepal, Kathmandu, Nepal.

Table 4. Average goat meat prices and human to goat ratios in the five development regions of Nepal.

<table>
<thead>
<tr>
<th>Development region</th>
<th>Human to goat ratio</th>
<th>Price (NPR/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern</td>
<td>2.7:1</td>
<td>33.44</td>
</tr>
<tr>
<td>Central</td>
<td>3.3:1</td>
<td>38.58</td>
</tr>
<tr>
<td>Western</td>
<td>3.1:1</td>
<td>40.53</td>
</tr>
<tr>
<td>Midwestern</td>
<td>2.7:1</td>
<td>31.16</td>
</tr>
<tr>
<td>Far western</td>
<td>3.9:1</td>
<td>40.16</td>
</tr>
</tbody>
</table>

facilities, and outlets only 1 or 2 days a week are real constraints to both consumers and producers.

The lack of slaughterhouses and storage houses is another problem. A network for the distribution of red meat is totally absent in Nepal. Slaughterhouses and storage facilities with credit and inspection facilities promote meat production (Rajbhandri 1984). There should be mechanisms to maintain excess goats away from the markets to regulate the supply of meat and control prices.

The goat industry of Nepal lacks a price-fixing agency. The lack of price control creates doubt and suspicion between primary producers and consumers. The proper pricing of goat meat is, thus, an effective means of regulating goat meat production.

Quality control is of concern to the consumer. Low-quality mutton from old ewes or aged goats is now sold as good-quality meat. Therefore, quality control and inspection of the dressed meat are essential to ensure that consumer preferences are met.

There is a lack of adequate credit facilities for goat farmers in Nepal. The same agencies provide loan facilities to farmers at minimum interest rates; however, goat production has not been included in their list of priorities.

The introduction of exotic breeds into Nepal has been problematic and haphazard. This is related to the absence of a proper breeding plan. There is also lack of fodder in terms of both quantity and quality. The production of good-quality fodder during the lean period (January–June) must be improved. This is one of the most serious constraints to goat production in Nepal.

Many farmers want a technology package for raising goats that deals with various aspects of production: feeding, breeding, housing, animal health, and economics. Poisonous plants and predators (tigers, leopards, and wolves) cause
considerable problems near the forest areas. Also major diseases have been noted in several reports on goat in Nepal (e.g., Morel 1985; Karki 1984). These diseases include liver fluke, internal parasites (e.g., tapeworms and roundworms), foot-and-mouth disease and foot rot, external parasites (e.g., mange, lice, and ticks), pneumonia, and brucellosis.

**Prospects**

The demand for goat meat in Nepal is high as it is accepted by all people; however, the supply cannot meet the demand. Therefore, goats are imported from Tibet and India, especially at festival time. The demand for goat meat is also high around the border areas of India. Goats are now exported to India and this market could be expanded by improving the goat-breeding program in Nepal. The price of castrated goat meat around the border area is NPR 50/kg in India; in Nepal, the price is NPR 45/kg.

Goat farmers earn more money than farmers in many other agricultural commodities. Realizing that goat production is a lucrative business, some richer people are showing interest in commercial goat production. Most of these investors are interested in starting with 50–100 goats.

Goats skins are another source of export earnings. They are exported to countries such as Italy, Japan, the United Kingdom, and the USSR. Export data from 1981/82 to 1986/87 show that export value increased from NPR 54.1 \times 10^6 in 1981/82 to NPR 222.6 \times 10^6 in 1985/86. The market declined to NPR 144.6 \times 10^6 in 1986/87 because of competitive prices; however, the demand for goat skins is still high.

Artificial insemination of goat is not practiced in Nepal. Therefore, attempts to introduce superior goat breeds for cross-breeding have always been costly. Artificial insemination facilities must be developed to reduce the cost of purchasing exotic goats.

The goat population density in western Nepal is low. Increased efforts are necessary to stimulate production in this area. Although goats are reared for meat production, milk production must also be encouraged; people are already aware of the benefits of goat milk.

**References**


