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Goat Meat Production in Asia

Proceedings of a workshop
held in Tando Jam, Pakistan,
13-18 March 1988

Proceedings



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13-18 March 1988

Editor: C. Devendra



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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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Economics of goat meat production

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Abstract: *An institutional economics approach is applied to goat meat production issues on small farms and among landless producers. Research has demonstrated the soundness of modern goat husbandry practices; however, the economics of production needs further investigation. Present thrusts in economics and systems research are discussed. Microeconomic analysis has limited use unless backed with appropriate macrounderstanding. Economic evaluation of new goat meat production technology requires introduction of an on-farm animal research and extension perspective in national programs. A research agenda appropriate for understanding economic factors contributing to goat production is presented.*

Résumé: *L'auteur applique les méthodes économiques à l'étude de la production caprine chez les petits agriculteurs et les producteurs sans terre. La recherche démontre la qualité des méthodes modernes d'élevage caprin; il reste à étudier les aspects économiques de la production. Il aborde les tendances actuelles de la recherche en économie et sur les systèmes. Sans une vue d'ensemble, l'analyse micro-économique n'a que peu d'utilité à moins de s'appuyer sur des analyses macro-économiques. L'évaluation économique des nouvelles techniques de production de viande caprine nécessite l'introduction de la recherche caprine à la ferme et le souci de la vulgarisation dans les programmes nationaux. On y présente un programme de recherche propre à la compréhension des facteurs économiques relatifs à la production caprine.*

Resumen: *En este trabajo se aplica un enfoque económico institucional a cuestiones relacionadas con la producción de carne de cabra en pequeñas granjas y entre los productores sin tierra. La investigación ha demostrado lo adecuado de las prácticas modernas de crianza de cabras; sin embargo, es necesario investigar más la economía de la producción. Se discuten las actuales tendencias en economía y en la investigación de sistemas. El análisis microeconómico tiene uso limitado a menos que esté apoyado por una macrocomprensión adecuada. Para hacer la evaluación económica de la nueva tecnología de producción de carne de cabra se requiere introducir la investigación animal en la granja y extender la perspectiva de los programas nacionales. Se presenta una agenda de investigación apropiada para comprender los factores económicos que contribuyen a la producción de cabras.*

Economic analysis of goat production systems has received increased attention in recent years. The technical feasibility of goat production under different management systems is better understood than the economics (Devendra and Burns 1983). The real contribution of goats to small farm income requires further analysis. Some studies point to the profitability of goat rearing on small farms and commercial enterprises. Because most small farmers raise dual-purpose goats, a variety of small-farmer needs such as children's education, petty cash, and family nutrition can be met (Soedjana et al. 1984). However, mere cost and return analysis customarily reported by research stations and extension departments is of little value to the farm community. Economists can significantly contribute toward a better understanding of goat production systems if they take an eclectic viewpoint, implying comparative economic analysis of the following:

- Alternative small-farm enterprises that require small investments similar to goat rearing;

- Institutional set ups to foster the dissemination of improved goat production technology;
- Evaluation of incentive schemes, impact of government policy instruments like price supports, and input subsidies; and
- Provision of low-cost information and economics of veterinary health.

This requires a combined approach to production and marketing and an explicit realization of the social goals and aspirations of small producers.

Economics as a subject is concerned with the allocation of scarce resources to meet unlimited desires in a fashion that leads to greater satisfaction. It deals primarily with evaluating the effects of marginal changes and quantifying their implications for the individual, firm, or society. Good policies require both sound economic analysis and political will. The latter is often missing.

Traditionally, emphasis has been on studying commercial farms whose managers have some training in basic economic principles of production and marketing. This research is easy to conduct because most large commercial farmers are willing collaborators, good records are often maintained, and such farms are conveniently located. However, limited information is available to the livestock researcher or the farmer interested in the economic aspects of goat production on small, isolated farms.

The market serves the useful function of signaling allocation of resources, timing of production, and decisions on sale, provided there are not too many distortions and government regulations. Access to such market information is restrictive, however, especially to small producers located in distant places. Middlemen take full advantage of this poorly coordinated information flow. Therefore, developing a capability in economic analysis is essential for agencies involved in researching new technologies and providing extension advice to farmers. Regular reports on cost and returns, input and product price variations in different markets, and government incentives to promote goat meat production should be summarized and made available to extension workers on a regular basis.

The purpose of this paper is to briefly address the economics of goat meat production on mixed noncommercial farms and by landless agricultural labourers. Because pastoral and nomadic goat production systems tend to be highly specialized and not representative of the average farm, they are excluded from the discussion.

Recent research on goat production systems

Over the past decade, considerable research has been carried out on various aspects of small ruminant production. Winrock International has been actively associated with the economic and systems component of the Small Ruminant Collaborative Research Support Program, title XII research project funded by the United States Agency for International Development. The economic component of this project has the following four objectives (Blond 1983).

- Characterize the existing production systems, including input–output relationships, the role of risk in decision making, and the overall economic rationality and efficiency.
- Study the constraints in transportation, processing, pricing, and storage systems as they relate to producer incentive and market efficiency, and how these may be modified to accommodate improved production practices.

- Study the availability of key inputs for the implementation of new recommended practices, including physical inputs, technical assistance, and credit.
- Assess the likely and actual impacts of proposed and implemented new production practices, especially as they concern nutrition, employment, income distribution, and local village economics.

The project has established small ruminant field research laboratories in different parts of the world. In the Asian region, field research is concentrated in Indonesia. Emphasis has been on the economic evaluation of new technologies, e.g., breeds, nutrition, health, and management on small farms. Besides direct involvement in research, the project aims to strengthen training in livestock by sponsoring in-country workshops on economic analysis of goat production systems, preparation of audiovisual aids and dissemination of information on small ruminants. The International Development Research Centre and the Food and Agriculture Organization of the United Nations play similar roles by organizing professional meetings where researchers can exchange ideas on current developments in small ruminant research.

A major concern

Despite the availability of modern technology for goat meat production, marketing, and processing, there have been limited benefits for the small farmer. Observations on the small farm situation in Pakistan for over 20 years suggest that it has remained unchanged. My grandparents, who have been small farmers for several generations, do not recall any changes in livestock technology, with the exception of some improvements in health care and vaccination campaigns. The latter measures do not contribute to increased productivity, but help in achieving yield stability. With crops, the situation is quite different.

In developed countries, the rapid expansion of commercial poultry and swine production can largely be attributed to the strong vertical and horizontal coordination of production, marketing, and processing functions, often with strong private sector participation. By comparison, it is unclear whether it is the lack of technical know-how (as some complain) or an inability on the part of national programs to translate and integrate the available knowledge on goat production into a viable technology package. It is more appropriate to develop a set of recommendations according to the needs of clients. Because most goat production operations are handled by women and children, extension programs targeted at improving the husbandry skills of these two groups would have a higher payoff than educating older farmers not directly involved in goat rearing.

From a research and development perspective, there is a need for a livestock representative. The rapid spread of the green revolution and the technology related to this can be attributed to the campaigns of the Nobel Laureate Dr Norman Borlaug. He was instrumental in promoting the Mexican wheat varieties that lead to dramatic increases in wheat productivity. Similarly, the International Rice Research Institute, located in the Philippines, participated with national programs to bring high-yielding rice varieties directly to the farmers. Wheat and rice are the major staples and national programs took keen interest in the new technology. By comparison, it is unfortunate that livestock in general and small ruminants in particular lack both international and national representatives. Although the debate on technology improvements for goat meat production should continue, the application of available technology to stimulate production represents a major chal-

lenge. It will be the integrators and synthesizers of information who will lead the way and not necessarily the technologists. Unfortunately, these skills are scarce, costly, and often beyond the reach of many developing countries.

With governments genuinely interested in increasing small ruminant productivity, leadership must rest in the hands of those few who can articulate the needs of farmers, influence government policy to support programs that affect the small farmers, and ensure sufficient continuity for achieving sustained increases in production. The gap between farm productivity and potential production is large enough to warrant immediate attention by policymakers.

Elasticity considerations

The demand for goat meat is directly related to changes in income. Some estimates indicate income elasticity of demand being greater than unity. For example, if national personal income increased by 10%, demand for goat meat would increase by more than 10% on average. With improvements in per capita income, an increased demand for goat meat can be expected in the future in many Asian countries, especially where there is a preference for goat meat.

Economics of goat meat production

Most people consider livestock economic analysis as only being concerned with the cost and returns or supply and demand analysis of the enterprise. This is partially true; however, such an analysis only tells one side of the story. The question of economics has to be looked at both from a microlevel (i.e., the farm/firm level) and the macrolevel or aggregate level of the economy.

Profitability, considered synonymous to economics, is only one of the many criteria used by farmers in making decisions. In the case of goat production, others include risk aversion, overcoming subsistence, income generation, family nutrition, means of investment, and inability or social unacceptability to participate in other activities because of lack of skills or social standing.

Whatever the economic motive, there is general consensus that farmers allocate resources efficiently (Shultz 1964; Hopper 1965). Farmers invest time, effort, and limited resources in activities that result in maximum benefit (not necessarily income) given a risk-prone environment. Therefore, to answer why farmers do what they do, factors influencing a series of decisions must be understood. A mere look at the cost of inputs, levels of use, and returns realized from the sale of the produce fails to explain the underlying decision-making process. Because farmers vary input use according to price, the analyst can only be certain about how the product-price relationship will change over time with a monitoring and evaluation system that updates information on a regular basis.

At the microlevel, economic analysis should answer three fundamental questions related to production: what to produce, how to produce it, and how much to produce. The different alternatives of what to produce should be evaluated and made available to the farmer. Obviously, each alternative will be constrained by the farmer's resources. The production method relates to technology. No single recommendation can be developed for goat production, even though it is easier to generalize livestock practices than crop technology, which is more prone to environmental changes. The production method will depend on the technology avail-

able to the farmer and the farmer's knowledge of the production process. Questions such as breed type, quantity of feed to use, housing of animals, and use of labour will differ with the type of farm. The quantity to produce is partially determined by the market. Small, landless groups find this decision to be the most crucial. Optimal herd size, herd age structure, and the demand and supply of goat meat in the market are all important factors.

Input costs

The feed component often requires a cash expense and labour is usually provided by the family. Child labour is extensively used in the upkeep of animals on small farms (Amir and Knipscheer 1987b). This allows farm families to diversify the use of adult labour, which is used for more difficult tasks like ploughing and transplanting. Among landless classes, there may be further constraints on opportunities for productive work. In surplus labour situations, the value of labour may be minimal if not zero. In cost and return analysis, the shadow price of labour should be used. Farmers do not attach a high value to child labour. Although the opportunity cost of such labour may be high, the child may be losing the opportunity for a proper education.

Feed costs include the purchase of forages, grains, supplements, and minerals. Farmers rarely provide prepared supplement mixes. Different salt and mineral mixes are common in Asia, and these costs should be estimated on a flock basis and several budgets prepared for sample farms. Large surveys that average expenditures across farms provide little information for deriving meaningful recommendations. A summary of costs among users of a particular set of practices versus nonusers is more appropriate.

Variable costs associated with electricity, fuel, medicine, and depreciation should be estimated to represent average conditions. Fixed costs on construction of shelter are often overestimated. Care should be taken when valuing the initial stock buildup. Many farmers prefer purchasing young does over adult bucks. This substantially reduces initial fixed costs. The farmers' own labour is highly valued and there is a tendency to overprice materials gathered from the farm (e.g., mud and sticks) in the Indian subcontinent. Only cash expenses such as roof material, strings, and polythene should be included. Costs should not be estimated based on a standard housing design developed at a research station.

Returns

The direct benefits of goat rearing are live animal sales, changes in herd inventory, milk consumption or sales, and possible manure sales. Methods for estimating these returns have been discussed by Amir and Knipscheer (1987a, 1988). These methods include partial budgeting, gross margins, financial analysis, and production function estimation. Local preferences such as castrated versus noncastrated male goat meat, goat age, colour preferences, and hairy versus non-hairy goats should be valued appropriately. Variations in local practices should be documented with reasons for the preference.

Cost and return analysis

The cost and return analysis from Indonesia shown in Table 1 pertains to a semicommercial farm; the approach for estimating costs on a noncommercial farm is identical. Meat production is estimated based on carcass weight. Direct

Table 1. Costs and returns (IDR)^a from small ruminant production of semicommercial farms at two locations in Java, Indonesia, in 1982.

	Cirebon			Garut		
	I	II	III	I	II	III
Costs						
Building	80000	13300	40000	300000	133333	750000
Equipment	18750	19700	33000	25000	30000	30000
Feed	459900	91250	2263000	912500	985500	7300000
Minerals	500	300	1000	500	1000	70500
Medicine	0	4800	20500	6000	141000	30000
Labour	120000	0	1095000	809200	2046800	3510000
Opportunity cost	123750	63000	105000	360000	667500	1920000
Others	0	0	0	0	0	128000
Total	802900	192350	3557500	2413200	4005133	13738500
Returns						
Meat/live-stock	463200	488250	955500	3770550	7584192	28800000
Milk	0	0	2920000	0	0	0
Manure	76650	10800	153300	350400	478150	1460000
Total	539850	499050	4028800	4120950	8062342	30260000

Source: Knipscheer et al. (1983).

^aIn March 1988, 1610 Indonesian rupiah (IDR) = 1 United States dollar (USD).

receipts of the sales of live animals are often better indicators. Costs pertaining to marketing should be excluded from the analysis and documented separately to show overall profitability.

A second example concerns goat meat production in Dera Kher Muqadam in the Punjab. Five small-scale farmers with an average landholding of 4 acres (1 acre = 0.405 ha) were interviewed in November 1987. The objective of this exercise was to gather information on returns to investment in goat production. This data is only illustrative. In deriving meaningful results, the number of respondents should be much higher.

Goat rearing is a secondary source income for these farmers. Farmers kept other livestock such as buffaloes, cattle, and chickens. All five farmers raised their own breeding ram. Each farmer had initially started off with one female goat and later increased the flock size. The common breeds reported by these farmers were Teddy (dwarf) and Barbari. There was an average of two kids per litter. The goats are normally grazed year-round and only fed concentrates during December and January when feeds are in short supply. The cost and return analysis reported in Table 2 is based on the average number of goats owned by five farmers.

Feed

The following ingredients are used in the preparation of feeds: wheat bran (0.5 kg at PKR 2/kg), dry bread (PKR 25/head per day), maize grain (0.25 kg/head at PKR 2.25/kg), and salt (30 g/head per month at PKR 3/kg) (in March 1988, 17.1 Pakistan rupees [PKR] = 1 United States dollar [USD]).

Labour

Goats are grazed for 8 h on government lands and hills. This task is often performed by children with little opportunity for cash income. On average, two family members spend part of their time on managing the goats in such activities as

watering, feeding, cleaning, and guarding against predators. The calculation of opportunity cost is difficult. First, the family members participating in the grazing operation are children less than 15 years old. The main loss to the children is education. The value of education time lost by participating in goat management is an area requiring research. Children less than 15 years of age are paid half the salary of adult workers. This rate has been used in the analysis. Farmers may not value their children's time in the same manner. Landowners, however small, rarely allow their children to work off the farm. Therefore, we should view this cost with skepticism. Although it is a true economic cost, it may not have a high priority in the farmers decision-making. It is estimated that for a 12-unit operation, it takes approximately 8 work hours per day. The wage rate for an 8-h working day is PKR 35.

Housing

Houses are made of mud and stones. Often, the land has a low opportunity cost. A shed worth PKR 3000 will last for 5 years and can house 20–25 goats. This cost is treated as fixed. Depreciation is also a fixed expense. It will occur regardless of whether goats are kept or not.

Other costs

The average cost of medicine was PKR 50/6 months. Some farmers lost animals to predators; this has not been included in the analysis.

Returns

The farmers sell only the bucks and maintain females for breeding. There is also a common practice of exchanging young male kids for an adult goat. Farmers market goats for PKR 350–400 for an adult animal. Adult female goats are valued at PKR 550. The value of manure is PKR 30/animal for 6 months.

Discussion

Cost and return analysis and sensitivity analysis for these goat farms are shown in Table 2. Four scenarios are shown in Table 2. The “actual” scenario is based on estimates made through field interviews. Analysis covers a period of 6 months. “Scenario A” includes an opportunity cost for fixed investment but excludes land value because land is not a consumable resource. No allowance is made for rent, assuming that appreciation in the future value will compensate for rent. This only affects the fixed cost, which is not included in the calculation of profit. Therefore, profits remain unchanged. “Scenario B” has the same assumptions as scenario A but incorporates opportunity cost of capital or bank lending rate assumed at 12% per year or 6% per 6 months. This estimate was derived by accounting for fixed investment (6-month period) and cash expenditures included under the variable cost column. It also includes a value adjustment for child labour to reflect time lost in education. “Scenario C” represents the farmer's perspective on cost and returns. This is a more realistic view and perhaps the one under which farmers make decisions. Note that labour is valued much lower than it is by the researcher, especially the value of child labour. Feed costs are reduced to reflect variation in input use and utilization of on-farm feed resources. Farmers do not value wasted bread as the economist does!

Note that although farmers view differences in costs, there are no major differences in returns. A number of points are worth noting. Economic analysis provides a true cost to the use of resources and financial analysis is the accounting procedure that focuses more closely on actual expenditures and earnings. Although farmers are good economists, they do not value resources in the same

Table 2. Cost and return analysis (PKR) of goat meat production in Dera Kher Maqadam, Punjab, Pakistan.

	Actual	Scenario		
		A	B	C
Fixed costs				
Stock ^a	2200	2000	2000	2000
Shed	3000	4000	4000	2500
Total	5200	4000	4000	2500
Variable costs				
Feed ^a	1492	1492	1492	900
Labour	4600	4600	7000	1500
Medicine	50	50	50	25
Mortality	500	500	500	500
Others	65	65	65	0
Interest foregone	0	0	0	0
Total	6707	6707	9272	2925
Returns				
Value of six males	2700	2700	2700	2700
Value of six females	3300	3300	3300	3300
Manure	450	450	450	450
Total	6450	6450	6450	6450
Profit ^b	-257	-257	-2822	3525

Source: Muzaffar Iqbal Bhatti, personal communication (November 1877 survey).

^aFour goats at PKR 550/goat. In March 1988, 17.1 Pakistan rupees (PKR) = 1 United States dollar (USD).

^bProfit = returns - variable costs.

manner as treated by professional economists. Therefore, one must not be confused at the different estimates one arrives at using alternative assumptions. Such results should not be dismissed without careful evaluation, especially when negative profits appear, and the economist erroneously concludes that the enterprise is not profitable.

With limited opportunities for investment, security, and steady cash flows, returns to investment in goat meat production are adequate, provided the assumptions with respect to labour, feed costs, use of household refuse such as bread, use of by-products, and traditional low-cost veterinary practices are handled with care. There is always a tendency among farmers to report high costs and low returns. Laying one's hands on the cash costs and those considered important by the farmer are key to sound economic analysis.

Research Agenda

Within the research program, because of limited resources, only key research questions with potential payoffs should be addressed. The following five topics can be included within national programs.

First, where economists are available, they should be included in multidisciplinary teams to look at constraints, productivity gaps, and opportunities at the farm level. Each technical recommendation should be supported with basic economic analysis. Some of this economic analysis can be performed by non-economists.

Second, small pilot projects with 30–40 collaborators rearing 100–150 does can serve as useful field laboratories. Detailed records should be maintained on inputs, outputs, herd size, animal weights, and mortality.

Third, procedures for careful testing of new technologies to confirm their viability at the farm level have been documented in several studies (Nordblom et al. 1985; Amir and Knipscheer 1987b, 1988; Singh and Ram 1987). These studies provide information relevant to developing on-farm animal research programs.

Fourth, careful summary of important input costs and goat meat prices should be prepared on a quarterly basis. This data set should be analyzed for forecasting price and demand relationships using standard econometric tools. International trade trends should be studied to determine the comparative economic advantage using domestic resource cost analysis.

Fifth, farmer training should be a regular feature of any research station. Unless research results can be communicated to farmers, the research is of little value. Economic analysis can demonstrate to the farmers the profitability or economic advantage of the new practice (e.g., a new breed, use of an antihelminthic drench, or use of supplements). Similar investigations into the design of low-cost procedures for disseminating information should receive attention from the economist.

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