

## 5. ANIMAL PRODUCTION AND RESEARCH IN PAKISTAN

Muhammad Yaqoob BHATTI\*

### Background

Pakistan (West) has an area of 310,400 sq. miles (803,900 sq. km). Out of a total area of 198 million acres 48 million acres are cultivated with 31 million acres having irrigation facilities and the rest 17 million acres being rain fed. 150 million acres comprise mountainous land and deserts or waste lands with 2% under forests. The human population stands at present at 64 million while the livestock population comprises 55 million heads of large and small ruminants as would be seen from the table-I below apart from 2 million horses, donkeys and camels and 13 million chickens:

**Table I. Livestock population**

Cattle	18 million
Buffaloes	12 "
Sheep	13 "
Goats	12 "

2. The livestock industry contributes about 38 per cent excluding draught power (8 million bullocks) to the overall GNP from agriculture sector and is tied up closely with 75 per cent human population living in rural areas, where it forms an integral part of agriculture. The nature of livestock industry in arid and semi-arid areas of Pakistan is different than that of irrigated areas in that it is based mostly on migratory patterns of livestock husbandry extending both to the nomadism and transhumance types compared to settle farming conditions in arable areas.

### Animal Breeding

3. There are distinct breeds of livestock amongst cattle, buffaloes, sheep, goats and horses in Pakistan. Among cattle Sahiwal and Red Sindhi are milch types, Bhag Nari, Dhanni, Dajal, Rojhan and Lohani are draught types, while Tharparker falls in a dual type viz; milk-cum-draught. Amongst buffaloes the Nili/Ravi and Kundi are the two distinct breeds both found in riverine areas of Punjab and Sind respectively. Similarly, there are about more than a dozen breeds of sheep and half a dozen breeds of goats. The sheep have mostly carpet type wool with both fat tailed and thin tailed breeds and the goats are hairy and milch as well as meat types.

4. Till recently the concept of pure breeding was followed in livestock in view of the hardy traits of the tropical livestock bred in Pakistan, but it has given way now to crossbreeding with superior exotic types for improvement in milk, meat and wool

---

\* Adviser, Animal Husbandry, Ministry of Food and Agriculture and Under-Developed Areas, Islamabad, Pakistan.

Note: The author could not attend the symposium. The report is compiled with the permission of the author.

production. An ambitious programme of artificial insemination in dairy cattle has been launched by use of frozen semen of proven Friesian and Jersey bulls. The plan is to use 100,000 doses of frozen semen for upgrading indigenous cows in the first instance. The preliminary trials conducted at Bahadar Nagar Livestock Production and Research Institute have given promising results in significant increases in milk yields of first generation crossbreds between Sahiwal and Swedish Red & White. The existing average yields for buffaloes are 3,000 lb. and for cows 2,000 lb. per lactation although individual records may reach from 6,000–9,000 lb. per lactation indigenous buffaloes and cows. Selective breeding would continue in the buffalo, while crossbreeding of indigenous cows will be progressively followed by use of frozen semen technique.

5. A beef production research centre has also been established at Sibi in Baluchistan province, where the heavy draught type Bhag Nari Cattle are being crossbred with the imported Drought Master beef cattle from Australia. This is the first effort in the country to develop a beef strain suitable for being reared in hot tropical conditions, which prevail over larger parts of the country. The initial results in the form of increased growth rates for the crossbred progeny have been forthcoming. In view of the increasing demands of red meat in the country as well as in export markets, the work on beef production research is expected to yield good dividends in the near future.

6. Sheep crossbreeding work is being undertaken at Jaba Sheep Farm in North Western Frontier Province, where the fine wool Ramboulette sheep are being introduced for improving the wool quality and yields from indigenous breeds. Similarly work is going on in the crossbreeding of local white goats with Angora goats for production of Mohair at the Rakh Khara Wala Farm. The mutton production research is being conducted at the various sheep stations in the country by crossbreeding of local breeds with Awassis and Poll Dorset sheep out of which the Awassi crossbreds have proved to be more hardy and productive.

### **Reproduction**

7. The problems of reproduction in the form of low fertility, fecundity, prolonged calving intervals and inapparent heat periods exist mostly in the buffaloes, which have a calving interval of 20 months and mature at the age of 3½ years. The late maturity of indigenous cows at 3 years to 3¼ years is also a limiting factor resulting in belated reproductory cycles. Similarly, the ovarian and uterine abnormalities as well as nutritional disorders accounted for 57, 30 and 13 per cent of the cases of infertility reported at one of the livestock farms. Research work is being conducted on reproduction and physiology at the Livestock Production Research Institutes and the Agricultural University, Lyallpur, but it is considered necessary that the adverse reproductivity traits of buffalo be investigated with a view to find genetic improvement on the physiologic basis of such traits. The milch buffalo could potentially become the Friesian of the East, if its adverse reproductory traits could be remedied as the relatively higher butterfat content milk that it produces is relished and sold at a premium price compared to cows milk in Pakistan.

8. No significant reproductory problems are faced in sheep and goats, which can have a fecundity rate of 85 per cent to 165 per cent in a year. On the other hand recent livestock census results in some parts of Pakistan have revealed increases of 50 to 100 per cent in sheep population and 100 to 300 per cent in goat populations over the past decade, which indicates the enormous reproductory potential and resilience in the small ruminants inspite of the increased consumption especially of goats under goat eradication programmes, which virtually backfired resulting in still greater increases in the specie least wanted. This has given second thoughts about the place small ruminants like goat occupy in the hierarchy of the domesticated animals and the utility thereof.

### Feeding and Management

9. Apart from the state controlled farms and the sub-urban stall-fed herds of cattle and buffaloes maintained by the private sector for supply of milk to big cities: (35,000 buffaloes around Karachi city) the vast majority of livestock are kept in small village herds of 4-6 cattle/buffaloes. However, about 0.8 million holdings were classified as livestock holdings out of 5.7 million Agricultural holdings in the 1960 census. The sheep and goats are generally collectively grazed on stubbles in irrigated areas, while the range lands maintain larger flocks owned individually or collectively by mostly nomadic herders and graziers. So it would appear that livestock industry in irrigated areas is based on the primary crop culture, which needs bullocks for draught power thus tying up some 5 million (1/6th of cultivated area) acres in fodder cultivation to feed 8 million heads of bullocks, while the rest viz; buffaloes, cows, sheep and goats compete in descending order for the scarce feed resources available on the irrigated lands. The reverine tracts also provide extensive grazing areas for cattle and specially buffaloes, which thrive there.

10. On the whole the total feed resources available in the irrigated areas accounting for the entire dry and green matter are only one half of the quantity required for maintenance of the existing numbers. Similarly the range lands, which provide perennial as well as annual grasses and shrubs for the migratory herds and flock maintained by nomadic or semi-nomadic people are overstocked at the rate of 6-9 times the carrying capacity of the land. This poses a great problem in the adjustment of numbers of livestock to available feed resources. The main difficulty in the introduction of a controlled grazing programme lies in the communal grazing rights held by the nomadic tribes over the range lands and the lack of legislation to limit the livestock ownership on the pattern of land reforms. The other problem that inflates the number of uneconomic surplus livestock in irrigated areas generally and the range areas specially is the lack of proper marketing due to depressed prices offered to farmer that leave little incentive for him to sell. The nomadic herder has a specially poor material culture and his needs for paper money are minimal, while the livestock numbers act as his mobile credit bank, which he can draw upon at times of need. This problem was highlighted in the results of livestock census in a part of Pakistan where more than 10 per cent sheep and goats males over one year old were found to be held in the flocks in addition to the young males of the lamb crop.

11. Efforts are being made to demonstrate the benefits of controlled grazing to herders by scientific management of stock on state lands or acquired private lands. Schemes are under way for provision of subsidised supplemental feed to cooperating farmers who practise proper grazing practices or who establish feed lots for fattening of males removed from range lands. It is felt that without a system of incentives it would not be possible to modernize livestock production management as the present price structure of both milk and meat is such that it is not conducive to healthy growth of the industry. The Green Revolution that extended to foodgrains, left the feeds/coarse grains outside its pale with the result that the same seed technology and inputs could not be provided for the production of livestock feeds thus depressing their production and raising their prices, making it uneconomical to feed to livestock, which had no price support for the production of meat and milk unlike wheat.

12. A Department of Farm Management has been established at the Agricultural University, Lyallpur, which undertakes studies on the fattening of old bullocks and the economics of different types of management and housing for livestock. Similar studies on the relative economics of buffalo and cow established that a buffalo was more economical than the cow, and could successfully compete with the net income from cash

crops per acre. However, this may not be the case with the improved/crossbred cow, which may be even more profitable than the buffalo. More studies are indicated on the economics of mixed farming of livestock which is usually the case in our cultivated areas. This would reveal the true cause and effects of an integrated livestock and crop culture, which has been the hallmark of our farming pattern and of which a thorough understanding is essential before it would be further improved upon. We must try to improve the livestock management in our rural areas within the existing close link up of crops and animals and no amount of isolated effort to improve one at the expense of other is going to succeed as it would set up a chain of negative feed back neutralizing the efforts towards improvement.

13. Research work is in hand to study the utilizations of industrial wastes, like bagasse, molasses, slaughter house byproducts, bone-meal and feed grade urea for formulation of cheap livestock feeds. This has become all the more necessary in view of the shortage of essential feeds and fodders for livestock. At present the installed capacity of feed mills is to the tune of 260 hundred thousand tons, but only half of this capacity is being utilized for the manufacture of poultry feeds as manufactured livestock feed use has not yet become popular in the country. The same was true of fertilizer use for crops in the beginning, which has increased several fold now due to generous subsidies given to the farmers for popularizing its use. Some of the important studies on nutrition being carried out at present also include *in vitro/vivo* studies of the bovine rumen digestion and the digestibilities of various feed materials grown in the country. Significantly higher digestibility coefficients have been found for crude fibre in buffaloes compared to cows.

### **Environmental Physiology**

14. The problem of environmental physiology is gaining importance due to the planned introduction of exotic genes in the indigenous cattle populations, which are well adapted to climatic and disease stressors. A fullfledged division of climatic physiology has been proposed in the newly expanded project of livestock production research in the country. So far climatic chamber studies have been made only in the case of poultry at the Agricultural University, Lyallpur. while basic data have been collected at the beef production research centre at Sibi about the physiological responses of imported as well as indigenous cattle in hot environments. Similarly, studies on adaptation of crossbred sheep are in progress at the Lyallpur Agricultural University, but this is a relatively new field for Pakistan and it would develop over a period of time as the problems of adaptation on superior genotypes are faced in the country.

### **Livestock and Populry Products**

15. Major products from livestock sector include food item like red meat, milk, edible fat, eggs and poultry meat as well as other products like wool, hair, hides and skins, guts, blood and bones. According to the projections made by the Agricultural University, Lyallpur with some modification made by the author the total quantity of each of the livestock products is given as below in Table II:—

16. It would appear that out of the food items sizeable quantities of milk at the rate of 125 kg per caput per annum could be made available. Out of this milk only 1/3rd is available as fluid milk as 1/3rd is covered in ghee or butter oil, while another 1/3rd is used in manufacturing of sweetmeats, etc. The main reasons for the lack of availability of all the milk as fluid milk lies in the lack of access to the milk producing pockets, which may be located in remote rural areas away from urban consuming centres. What is needed, therefore, is the arrangement to chill and transport fluid milk from production areas in refrigerated tankers to processing plants in or near cities. There are 18

Table II.

Milk	7.7 million tons
Red meat	0.25 million tons
Animal fat	30 thousand tons
Eggs	60 million
Poultry meat	34 million lb.
Wool	40 million lb.
Animal hair	8 million lb.
Hides	3.2 million pieces
Skins	9 million pieces
Guts	11 million pieces
Bones	0.13 million tons
Blood meal	2,000 tons
Meat meal	2,000 tons

milk plants in private and public sector of 350,000 litre capacity per shift, but only nine of these are commissioned and even these do not run on their full capacity. According to a recently conducted study by FAO Dairy Mission under International Scheme of Co-ordinated Dairy Development it has been recommended to locate dairy farming demonstration centres in the milk collection area to encourage the supplies of raw milk and earning of cash incomes in milk producing areas.

17. The meat availability per caput per annum is very low in the country with 9 lb. of red meat and  $\frac{1}{2}$  lb. of poultry meat and roughly 10 eggs per person. This points out to the low level of animal protein in the the average diet. One of the cardinal reason for the low per-caput intake of animal proteins (which are short by 12 grn. per day of the recommended dietary allowance) lies in the low offtakes of livestock, which stand at 18% per cattle, 12% for buffaloes, 36% for goats and 25% for sheep. If the offtakes of sheep and goats could be increased to 50 per cent and cattle and buffaloes to 25 per cent, almost 50 per cent increase could be affected in the meat availability. As mentioned before the problems of efficient marketing are closely tied up with socio-economic incentives for marketing surplus stock as well as the pricing structure, which is not favourable for livestock producers who get low prices for their produce with a large share of profits going to the middlemen in livestock trade. A system of state procurement at a satisfactory base price appears to be one of the solutions to improve marketing offtakes. Similarly, the case of 1.5 million male buffalo calves, which are allowed to die as unwanted animals each year and which if reared by giving economic incentives could provide 300 to 500 million lb. of additional baby beef of the nation's protein resources.

18. The poultry industry in Pakistan is showing satisfactory growth, starting from nothing in 1962 it has now progressed to a hatching capacity of 16 million chicks in the commercial sector of both broiler and layer types with plans for doubling of present capacity in one year. The main affliction of poultry industry as elsewhere has been the high feed prices, which are affected mostly by international price trends of fish meal and other animal protein sources of feed. To curb the prices of feed, certain essential items, like blood meal, meat meal, sesame oil cake and corn gluten meal have been banned for export, while 30% duty has been levied on export of fish meal and cotton seed decorticated oil cake from Pakistan. The main problem still remains in the form of low availability and high prices of coarse grain like corn and sorghum, which has not been produced in greater quantities in the past decade. Since poultry competes with humans in the consumption of coarse grains in a developing country, it becomes of

utmost importance to increase the yield per acre of feed grains to achieve the phenomenal potential of hybrid grains as has been made possible in U.S.A. and Australia. In other words the extension of Green Revolution from food grains to feed grains and fodder is imperative for achieving a balanced growth of poultry as well as livestock industry in Pakistan.