

Theme 5 : Livestock and fishery improvement and management

5.3 Development of technologies for improving livestock and poultry health and production

5.3.1: Traditional animal husbandry and fishery practices and disease occurrence pattern in some selected villages of Bihar

(A Dey. and D. K Kaushal)

Animal husbandry practices :

Survey was undertaken on animal husbandry and fishery practices in six villages of Bhojpur, Muzaffarpur and Darbhanga districts, two villages from each district. It was observed that animal husbandry in these villages is a remunerative practice generating as much as 16 - 55 per cent of the farmers' total income with more dependency on livestock in flood prone areas of Muzaffarpur and Darbhanga districts. Buffalo holding per 100 households was found more than crossbred cattle or indigenous cattle indicating the preference of buffalo over cattle. Overall, buffalo comprised 51.9 per cent of total livestock population in Bhojpur district and 20-25 per cent in villages of Darbhanga and Muzaffarpur districts. Out of total cattle, crossbred accounted for 26.6 per cent in Bhojpur district and 6-10 per cent in Darbhanga and Muzaffarpur districts (Fig. 28). Goat was a substantial source of livelihood in flood prone areas of Darbhanga and Muzaffarpur districts. It accounts for as much as 60-66 per cent of total livestock population in these districts. However, pig and backyard poultry are considered as a source of livelihood for landless people as 98-100 per cent of these species were owned by landless only. Production and reproduction performance of crossbred cattle, indigenous cattle and buffalo had been recorded. The lactation length in crossbred cow, indigenous cow and buffalo was recorded at 277.3 ± 13.2 , 274.0 ± 17.0 and 290.0 ± 15.6 days respectively. Overall, 46-48 per cent of crossbred cattle and buffalo are found in production in these districts. Performance of crossbred cattle was observed to be better in respect to all economic traits in field conditions.

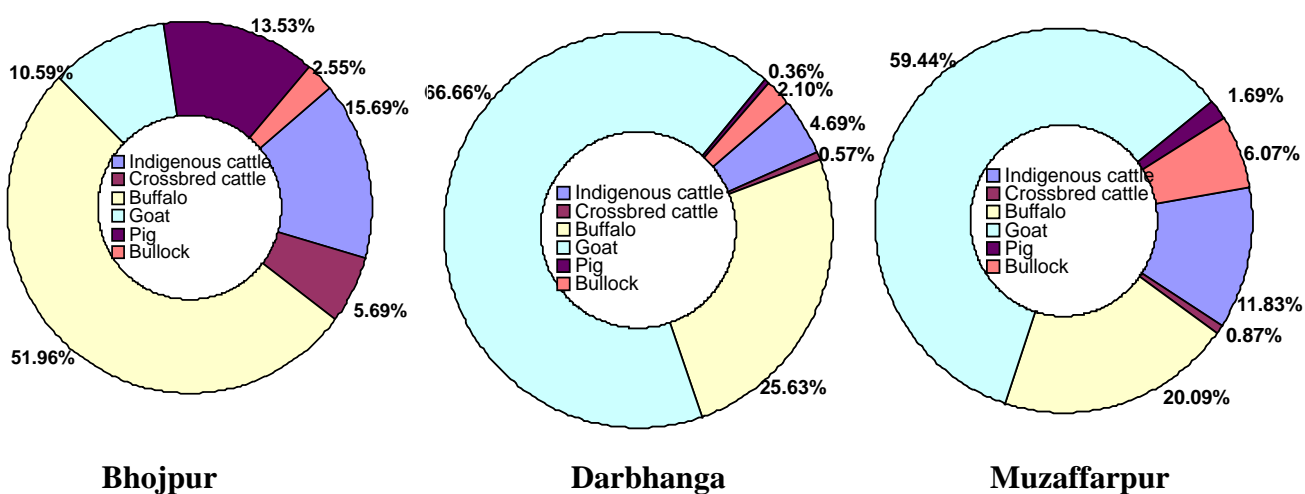


Figure 28. Composition of livestock (per cent) in Bhojpur, Darbhanga & Muzaffarpur districts

Supplemental feeding of pregnant and lactating animals are practised. Balanced concentrate mixture is fed to crossbred cattle and buffaloes. Quantity of concentrates depends on the milk yield and its availability. However, majority of farmers do not follow any feeding standard. On an average 1.0 kg concentrates are fed per 4 kg of milk production.

Parasitic infestation was common in all types of animals in all surveyed villages where anti-parasitic therapy is not practised. Incidence of infectious diseases like Foot-and-Mouth Disease, Hemorrhagic Septicemia and Black Quarter are common in these areas especially after flood.



Chaffing of green fodder



Collection of grass for animal feeding



A village goat pen



Animal grazing on field after floodwater subsided

Fishery practices :

Bihar has vast untapped inland water resources in the form of tanks, ponds, chaur, mauns, and rivers especially in north Bihar, which throws enough scope for the development of fisheries through enhancing water productivity by adoption of integrated farming system approach. The water resources

available in the state for development of aquaculture are (i) tanks / ponds - 68820 ha, (ii) Mauns (ox-bow lakes) - 9930 ha and (iii) Chauras (waterlogged area) - 40,000 ha.

The fresh water resources in villages of Darbhanga and Muzzafarpur have immense potential and resources for aquaculture but are untapped. Most of the fish farmers have medium level knowledge (67.3 per cent) followed by low level (20.5 per cent). The extent of adoption of practices of scientific pond culture technology among the farmers of north Bihar are indicated in the Table 15.

Table 15 : Extent of adoption of fishery practices

Practices	Extent of adoption
Eradication of weeds before stocking	Done manually
Manuring	Cow dung (60 per cent)
Removal of predatory fish	Bleaching powder (30 per cent)
Species stocked	IMC, exotic crops
Source of seed	Local entrepreneur
Supplementary feed	40 per cent practiced
Ingredients	Rice bran, Mustard oil cake
Health management	Liming 70 per cent
Aeration	30 per cent Beating, Netting
Monitoring growth of fish, plankton, dissolved oxygen	50 per cent monthly
Seeding behavior	60 per cent Consult fellow farmer
Harvesting	Drag net, Chatti Jal, Poisoning
Technology	Traditional, mostly single stocking

The main constraints in fish production in north Bihar includes feed related problems (80 per cent), non-availability of quality seed (50 per cent), marketing problem (10 per cent), technical problems (50 per cent), credit problems (90 per cent) and social problems (50 per cent).



A farmer weaving cast net



Fishing in flood plain wetland

5.3.2: Development and evaluation of economic ration based on locally available feed resources for milk production

(A. Dey, B. P. S. Yadav and N. Chandra)

Different feed resources from the farmer's field of Bhojpur, Darbhanga and Muzaffarpur districts were collected and stored for nutritional analysis. Information was also collected on green fodder production scenario of the villages, which has high value for increasing milk yield.

In irrigated areas of Bhojpur district, rice and wheat straw constitute the major dry fodder resources. Sugarcane tops are the source of green fodder in sugarcane producing zone of north Bihar. Pulses like lentil, gram, urad, arhar and moong whereas oilseeds like rye, mustard and linseed are grown and their residues and by-products are fed to the livestock in all the three surveyed districts. Fodder production is very limited confining to only 8.0 per cent of total cropped area. Fodder (*Sorghum sp*) is produced during April to June when land is fallow after wheat harvest. During December to March some leguminous fodder (*Trifolium alexandrinum*, *Lathyrus sativa* and *Brassica sp*) are cultivated. However, during lean period local grasses and vegetation are fed to dairy animals. In Darbhanga and Muzaffarpur districts, buffalo and indigenous cattle are grazed on fallow field after rice harvest. Lack of irrigation as well as unavailability of quality seed is the main constraint for fodder production. High yielding crossbred cattle and buffaloes are fed concentrate mixture purchased from local market mixing with rice/wheat bran or chunnies.

The common practice of feeding includes wet, dry and cooked feeding system. Wet feeding system is of two types-sanni and moist. In sanni (Swill) feeding system, chaffed dry roughage and concentrates are mixed together with excess of water and fed to dry and draft animals. Separate drinking water is not provided. In moist feeding system, chaffed dry roughage and concentrate are mixed thoroughly along with little water. Drinking water is given separately. This system is followed for lactating animals. In dry feeding system, chaffed dry roughage is mixed with green fodder and fed to unproductive dairy animals. In cooked feeding system, concentrate is cooked and mixed with excess of water and molasses and fed to lactating animals just after calving. Roughage is fed separately. This type of feeding system is practiced for about 2 weeks.

Chemical composition of different feed ingredients and some fodder have been analyzed and presented in Table 16.

Table 16 : Chemical composition of feed samples (per cent DM basis)

Ingredients	OM	CP	EE	CF	NFE
Rice bran	81.8	6.8	2.3	35.1	37.6
Rice polish	90.9	12.7	12.5	15.4	50.3
Rice grit	91.4	9.5	0.7	6.1	75.1
Wheat bran	91.4	15.3	3.3	16.4	56.4
Maize grain	96.8	9.3	2.1	4.0	81.4
Arhar chuni	90.4	14.3	2.0	26.2	47.9
Lentil chuni	89.4	11.5	0.9	43.0	34.0
Sudan grass	92.0	7.5	1.4	34.4	48.7
Berseem	89.3	18.9	1.5	35.8	33.1



Rural cattle feeding system



Storage of bhusa in locally made Bhuskar in flood prone areas



5.4 Techniques of fodder production round the year and enrichment of crop residues and agricultural by-products

5.4.1: Development of fodder production strategies for rainfed and irrigated conditions of Bihar

(S. K. Singh, B. P. S. Yadav, A. Dey and S. K. Das)

Field experiments were initiated during Kharif 2006 and laid out in complete randomized block (CRB) design with the following treatments.

- a) Rainfed fodder based cropping systems with four replications namely Sorghum+cowpea-oat+mustard- sorghum+cowpea (C_1), Maize+cowpea-oat+mustard-maize+cowpea (C_2), Hybrid napier+cowpea-hybrid napier+mustard-hybrid napier+cowpea (C_3), Subabul+Alley fodder crops as in C_1 (C_4), Subabul+Alley fodder crops as in C_2 (C_5), Subabul+Alley fodder crops as in C_3 (C_6).
- b) Irrigated fodder based cropping systems with four replications namely Sorghum+cowpea-oat+mustard-sorghum+cowpea (C_1), Sorghum+cowpea-berseem+mustard- sorghum+cowpea (C_2), Maize+cowpea-oat+mustard-maize+cowpea (C_3), Maize+cowpea-berseem+mustard-maize+cowpea (C_4), Hybrid napier+cowpea-hybrid napier+mustard-hybrid napier+cowpea (C_5), Hybrid napier+cowpea-hybrid napier+berseem-hybrid napier+cowpea (C_6).

The organic farming principles and practices were followed. Soil samples were collected from the experimental plots and analyzed for physical and chemical properties. The soil was silty clay loam with pH 7.7 and electrical conductivity 0.19 ds/m in 1:2 soil: water solution. The initial soil samples (0-30 cm) were analyzed and organic carbon, available nitrogen, available phosphorus and available potash were found to be 0.96 per cent, 3.12 kg/ha, 40 kg/ha and 415 kg/ha, respectively.

During Kharif, fodder crops were grown under rainfed as well as irrigated conditions. It was observed that the fodder crops survived well with the help of rainfall. Irrigation significantly increased the green biomass and dry matter yields (Table 17).

Table 17 : Green and dry biomass yields (t/ha) under different fodder based cropping systems

Ecosystem	Fodder based cropping system	Green biomass	Dry biomass
Rainfed	C ₁	26.8	8.8
	C ₂	21.7	7.2
	C ₃	22.5	7.7
	C ₄	20.3	6.4
	C ₅	15.1	5.4
	C ₆	16.5	5.6
Irrigated	C ₁	33.5	10.7
	C ₂	33.4	10.6
	C ₃	25.9	8.4
	C ₄	26.0	8.5
	C ₅	27.3	9.0
	C ₆	27.4	9.1



Cultivated fodder production: a) Berseem; b) Oat and mustard; c) Mustard and oat, mustard and berseem

Introduction of Jamnapari Goat

(S. K. Das, B. P. S Yadav and A. Dey)

Jamunapari goats were maintained in semi intensive system with 7 - 8 hours grazing and rest part in stall-feeding. Goats are being housed in semi open shed with concrete floor and asbestos roof. Besides grazing, goats are being fed concentrate mash feed consisting of 65 per cent maize crust and 35 per cent arahar chuni. @ 100 g / head / day. There were six kidding in the last year with 83 per cent single birth and 17 percent twin birth. Average litter weight at birth and litter weight at weaning was found to be 2.6 ± 0.1 kg and 8.5 ± 0.4 kg respectively. Weaning was practiced at two months of age. Regular deworming was done with broad spectrum anathematic. Live weight of goats in different weeks, weekly weight gain and average daily gain under this housing, feeding and management condition were recorded. It was found that live weight of goat was increasing gradually with significant ($P < 0.01$) difference between the weeks. Weekly weight gain and average daily gain was decreasing gradually up to 8 weeks and then increased gradually up to 14th weeks, afterwards again decreased gradually up to 44th weeks. Highest growth was observed in the 1st week i.e. 134.1 g / day with an overall mean of 79.2 g / day (Figure 28). Similar to live weight, significant ($P < 0.01$) difference was observed in case of weekly weight gain and average daily gain.

It was found that live weight, weight gain and average daily gain were significantly correlated with maximum temperature, minimum temperature, morning RH, evening RH and solar radiation, but non - significantly correlated with wind speed and rainfall. Live weight was negatively correlated with maximum temperature and relative humidity. But weight gain and average daily gain were positively correlated with maximum temperature and relative humidity. Live weight was positively correlated with minimum temperature and solar radiation. However, weight gain and average daily gain were negatively correlated with minimum temperature and solar radiation. Live weight was positively correlated with wind speed whereas weight gain and average daily gain negatively correlated with wind speed.



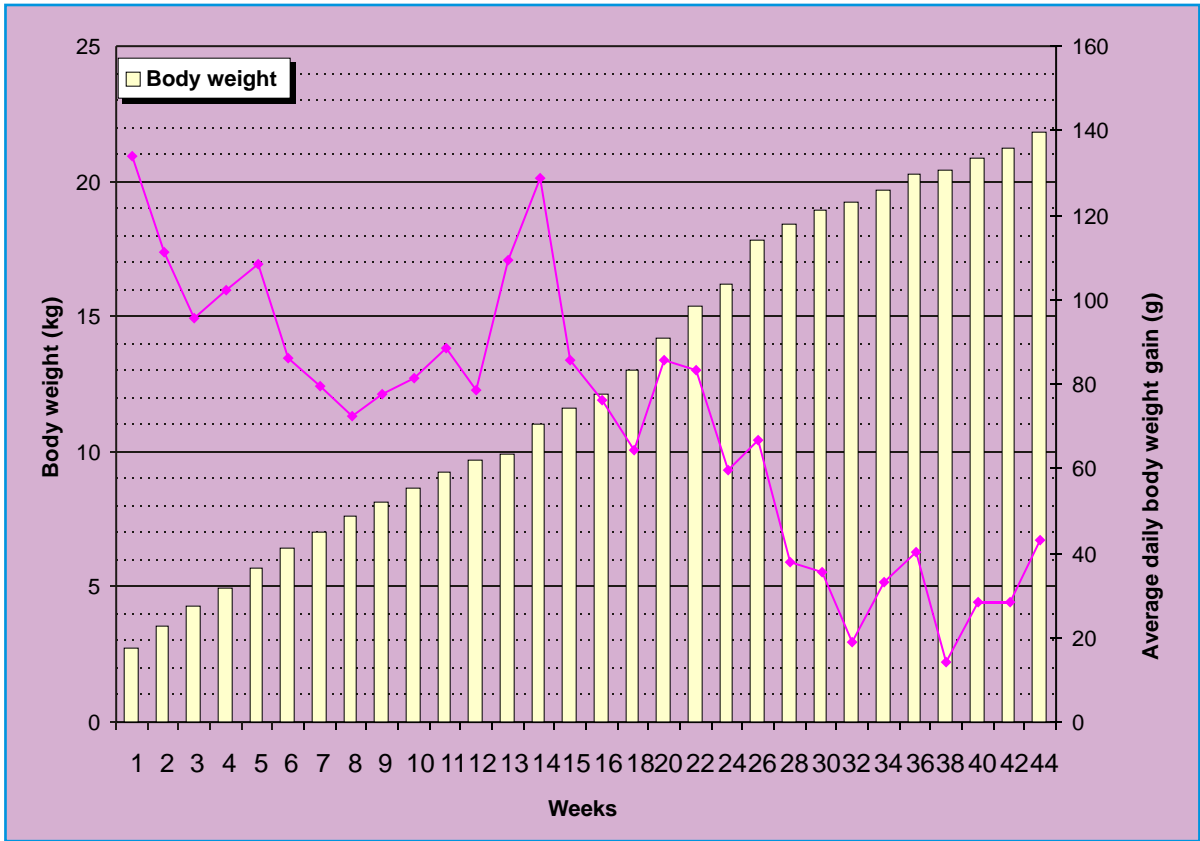


Figure 29 : Growth of Jamunapari goat maintained at institute farm

