

Chapter III



Animal Resources Development

Animal Resources Development

A. Cattle and buffalo development

1. Emphasis on future cattle and buffalo development should be on increasing milk production and improving the work efficiency including source of energy.
2. Milk Production should be on commercial and remunerative basis to attract the farmers and should be attempted through planned cross-breeding, selective breeding and grading up of indigenous cattle, selective breeding and grading up of buffaloes.
3. Areas which do not offer scope for marketing of milk and where introduction of cross-breeding is difficult, farmers should be helped to replace progressively their low producing nondescript cattle by grading up local stock. Simultaneously emphasis should be given to buildup infrastructural facilities in those localities.
4. Areas where artificial insemination is to be introduced should be adequately served by dairy extension work. Priority should be given to areas where SC, ST and minority population is high.
5. Fixing targets of work would be advantageous in areas where artificial insemination is introduced for the first time and in areas where artificial insemination work continues to be poor. Incentives should be provided to the Livestock Development Assistants / work force showing good performances.
6. Farmers should be organized into herd improvement associations for implementing milk recording programmes. Registration of eligible animals in herd books should be progressively introduced.
7. Farmers should be motivated to take measures for prevention of preservice anoestrus. They should be induced to maintain.
 - (i) Reproductive records, calving, heat and service dates.
 - (ii) Absence of recorded oestrus at the end of 60 days of post pertinent period in an alarm.
 - (iii) Examination of all animals which had not been observed to come to “heat”.
8. A strong extension support is suggested to secure active participation of the farmers for adoption of good husbandry practices to bring about the desired results. Training camps of short durations may be organized for the farmers at the village level very frequently to educate them with the help of audiovisual aids, lectures, competitions, etc. Some of the farmers cannot even detect oestrus in their animals effectively causing a big deterrent to the artificial insemination programme.
9. The following areas of research should be given due consideration:
 - (i) Developing appropriate strategies for progeny testing of the cross-bred bulls under field and farm conditions.

- (ii) Locating optimum levels of exotic inheritance under different strata of managemental and feeding standards.
 - (iii) Studying genetic consequences of *inter se* mating of cross-bred populations.
 - (iv) Investigating genetic consequences of multiple ovulation and embryo transfer technology for getting more number of superior genotypes replicated.
 - (v) Improving the use of animal [livestock] power as a source of traction energy in view of acute shortage of fossil petroleum fuels and its derivatives.
 - (vi) Studying the importance or otherwise of genotype and environment interaction.
 - (vii) Conducting karyotype analysis in physiological and anatomical abnormalities.
 - (viii) Study of biochemical polymorphism for production traits of bovines.
10. Particular attention has to be given to bringing those farmers within the fold of the functional literacy programme who can not utilize the development facilities because of their low literacy standard.
 11. The farmers training should include the farmers at the lower socio-economic levels.
 12. There should be at least one farmers training center for every sub-division. This center may be set up under district Planning Committee.
 13. Farmers education and training should include courses on organization individual skills, family skills and continuing education skills.
 14. The refresher course for extension officers, technologists and subject matter specialists should be organized regularly. The courses should be reviewed every three years and all field officers should be exposed for orientation after every 3 years.
 15. Particular attention will have to be given to bring those farmers within the fold of the functional literacy programme who can not utilize the developmental facilities because of their low literacy standard.
 16. There is immediate need to train farmers and members of farm families to improve their competence in the profitable processing of livestock products.
 17. Domestic livestock management for production is mostly done by women in rural areas. Special training programme for animal resource development with suitable work force should be arranged in farmers training centers.
 18. Documentation of success stories of livestock production and fodder development as economic enterprise should be made through films in Bengali language neutral illustrative posters should be prepared.
 19. A system of performance recording for locating superior males of 75 per cent of improved traits of production from suburban areas and such other places for use in rural areas in future is suggested.

Immediate measures recommended

1. The reproductive efficiency has to be improved by reduction in calving interval, increase in percentage of “In milk” cows to be achieved by :
 - (i) Enhanced scale of feeding (green oriented) with mineral and nutrient supplementation.
 - (ii) Organization of three monthly fertility camps in every animal health centre for examination of genitalia of animals and appropriate treatment of problem cases.
 - (iii) Educating farmers to get their animals checked if they do not get conceived by the third month after calving.
2. Prevention of migration of superior crossbred cows to other States :
 - (i) Registering all cows yielding above six litres of milk (Elite cows) during the first month of lactation (they are likely to achieve a peak yield of 8-10 kg) in a “Herd Book”. Departmental Staff / work force / P.R. bodies may record daily yield of all crossbred cows once between 15th and 20th day after calving by three times milking; First day’s evening milking to empty the udder fully and the next day’s two milking to estimate daily yields.
 - (ii) Such farmers should be encouraged to go for cattle insurance and provided feed regularly on cost. Such milk producers have to be given a preferential service.
 - (iii) The 149 cattle markets of the State may be taken up by the Panchayat Samities for organizational improvement.

The farmer-owners of elite cows may be given incentives for selling their cows to the Govt. only, so that they can be relocated at other places in the State. Low yielding cows (between 4 to 8 years of age) can be used for further grading also.

3. Introduction of A.I. Cards for each cow for recording artificial insemination, health care details with particulars of progeny born. This can give details of A.I. and calf born.
 - (i) Establishment of one A.I. centre for every 1000 breedable cows.
 - (ii) Ensure availability of semen according to the State breeding policy.
 - (iii) Infrastructural development of A.I. centres to be organized.
 - (iv) Institution of annual incentive allowance for selected farmers who have been successful in raising improved varieties of high yielding cows. Such group of farmers may be encouraged with special privileges.
 - (v) To fulfill the target of semen production, procurement of quality improved bulls for A.I. Centre should be ensured from reputed farms as well as from farmers of the State if available.
 - (vi) In all the blocks only approved breeding bulls should be permitted according to the provisions in West Bengal Livestock Improvement Act, 1954.

- (vii) Facilities available with selected Pinjrapole/Gaushala, e.g., Sodepur, Liluah, Waria (Durgapur) may be utilized for developing sizeable herds of purebred cattle and for undertaking a breeding programme for increased milk production and fodder production. The Govt. of India should provide financial assistance for creating adequate facilities and operational costs.
- (viii) For areas with high yielding indigenous cattle outside the ambit of cross breeding with exotic breeds, intensive selective breeding should be undertaken.
- (ix) Bulls used for breeding should be of superior pedigree and preferably progeny tested.
- (x) Artificial Insemination services should be ensured from morning till evening on all the days of the week.
- (xi) The Officer-in-Charge of A.I. centres should have thorough practical training in A.I. Centres should have thorough practical and theoretical training in A.I. and physio-pathology of reproduction.
- (xii) Since milk production is a character which is sex-limited, the genetic merit of a bull has to be evaluated on the basis of its female relatives. Due to extensive adoption of artificial insemination and increased utilization of males compared to females, the progeny testing of bulls has to be taken up to bring about genetic improvement in cattle. Open Nucleus Breeding System (ONBS) with Multiple Ovulation and Embryo Transfer (MOET) can be considered for sire evaluation to shorten the time necessary for the purpose.
- (xiii) Farmers should be motivated through counseling to dispose their cows after fifth lactation for economic reasons.
- (xiv) Male calves not born of elite cows should be castrated within four months. There may be incentive for this. Likewise male calves of elite cows may be purchased by the Govt. for breeding purposes.
- (xv) The model scheme of induction of trained private Artificial Inseminator (*Prani bandhu*) in West Bengal has attained reasonable success in the last four years. They have been quite effective in door step delivery of artificial insemination and preliminary animal health care services. In every G.P. there should be at least two such *prani bandhus* for wide coverage of artificial insemination.
- (xvi) Extensive cross breeding with exotic breeds may not be successful in Purulia, Bankura, Paschim Medinipur, Birbhum districts. The crossbred animals are usually more susceptible to environmental stress. So selection of local improved breeds should be made for these districts.
- (xvii) No breeding bull or its semen should be used for more than two years in any given area to avoid inbreeding.

- (xviii) Budget provision should be adequate in this primary sector of development. Developmental activities are not picking up at the desired level often for financial crunch.
 - (xix) Orientation of field workers should be organized every three years through on the job training, workshops and seminars.
4. State Government should set up a Committee of Experts comprising of representatives from the concerned State Govt., Department of the University of Animal and Fishery Sciences, Paschim Banga Go-Sampad Bikash Sanstha, reputed scientists from related fields (representatives) of farmers. This Committee will study the implementation of State breeding policy and identify associated problems through systematic evaluation. This Committee will make comprehensive suggestions on the implementation of policies and monitoring of procedural issues.
 5. The buffalo should be developed not only for enhancement of milk production but also for making it a source of production of quality meat.
 6. The West Bengal University of Animal and Fishery Sciences should take-up research programmes for studying reproduction and production physiology of the buffalo.
 7. Research studies on the effect of feeding and husbandry on fattening of buffalo calves should be undertaken.
 8. Special drive should be made to develop export trade in buffalo meat. There is urgent need for taking up promotional measures to build up export trade in cattle and buffaloes.
 9. Availability of adequate land for maize cultivation should be ensured with subsidies towards the cost of seed, fertilizers and irrigation to encourage the farmers. Initially, Bankura, Purulia, Birbhum, Paschim Medinipur, Western part of Bardhaman district, Uttar and Dakshin Dinajpur, Malda and Murshidabad may be taken up for this purpose.
 10. The sale price of milk and its products should be fixed in a manner that would enable the organised dairy industry to pay remunerative price to the milk producers and meet the cost of collection, processing and distribution of milk and milk products.

B. Small animal development

Goat development

1. (i) The Black Bengal goat breeding strategy and ONBS programme in the State must be introduced to avoid dilution of QIT (Quantitative Inheritable Trait) of this breed, which is unique.
- (ii) Zonal goat breeding centres should be established in the six agro-climatic zones of West Bengal to produce superior bucks in order to meet the demand of proven Black Bengal buck in the State.

- (iii) The valuable germplasm resource of Bengal Goat need to be improved through Open Nucleus Breeding System coupled with the application of frozen semen technology, progeny testing programme and use of proven bucks for breeding. However, *in situ* and *ex situ* conservation is of utmost necessary to maintain the superior germplasm of the breed.
- 2. Establishment of a special wing under the Animal Resource Department for the growth and development of small animals such as goat, sheep, pig, rabbit, etc. is strongly recommended.
- 3. Compounded feed industry and complete feed bailing should be promoted in view of crunch of grazing land and frequent floods in the state.
- 4. Availability of essential vaccines and life saving drugs at districts and rural clinics needs to be ensured. Pro-active goat health coverage can only prevent health crisis.
- 5. (i) Small but hygienic abattoirs at the rural sector are needed to be established with Public-Private Participation and specified hygienic retail meat shops in the markets should be made mandatory.
(ii) Meat inspection and certification regulations are required to be made rigid.
(iii) Marketing infrastructure at the Panchayat / Block level is essential to ensure reasonable sale price to SHGs and to provide facilities for industries engaged in value added meat products with special emphasis on small and medium scale meat industries in the State.
- 6. Skin and by-product marketing needed to be systematized and linked up with the Leather Complex at Bantala and feed production centres.

Sheep development

1. There are four major breeding tracts of sheep in West Bengal. The breeds involved are Garole (Sunderbani), Bonpala, Chotanagpuri and Shahbadi. The improvement and development programmes have been delineated tract-wise.
 - (i) Sheep genetic resource should be conserved *in situ* and improved through well planned breeding strategy coupled with the application of frozen semen technology, progeny testing programme and use of proven Garole (Sunderbani) rams for breeding.
 - (ii) The breeding programme and strategy required for the Garole (Sunderbani) breed must not be diluted at any cost since Garole (Sunderbani) inherits the world famous high fecundity *booroola gene (FecB)*.
 - (iii) Human resource development in sheep farming is essential. Technocrats would need in-service continual education to cope up with contemporary knowledge gain and application in the field.
 - (iv) A.I. with frozen semen and Open Nucleus Breeding System (ONBS) programme must be introduced to achieve any sustained gain in sheep productivity.

2. Compounded feed industry and dry-cum-hay fodder bailing should be promoted because of nonavailability of grazing land and frequent droughts and floods in the State. The feed, fodder and related issues should be under the control of ARD without further delay.
3. Availability of essential vaccines and life saving drugs at the district level and rural clinics need to be ensured. Pro-active sheep health coverage can only prevent health crisis.
4. Small but hygienic abattoirs at the rural sector and specified hygienic infrastructure for every meat shops in the retail markets at city and urban areas should be made mandatory.
 - (i) Sheep genetic resource should be conserved *in situ* and improved through well planned breeding strategy coupled with the application of frozen semen technology, progeny testing programme and use of proven Garole (Sundarbani) rams for breeding.
 - (ii) Co-operative marketing infrastructure at the Panchayat / Block level is essential to ensure reasonable sale price to women SHGs and to provide facilities to industries engaged in the marketing of value added mutton products.
6. Meat inspection and certification regulations are required to be made rigid.
7. Skin and by-product marketing needed to be systematized and linked up with the Leather Complex at Bantala and feed production centres.

Pig development

1. Technical manpower need to be developed alongwith specialized training (including A.I.) at the Pig Breeding Farm at Haringhata.
2. A.I. needed to be introduced invariably in all pig breeding units. All local black pigs (excluding Ghongroo) needed to be upgraded by using LWY semen through A.I.
3. Ghongroo pigs (black in colour, characteristic facial feature, large size and good farrow) should be essentially conserved, developed and promoted in its home tract by strictly adopting the A.I. inclusive ONBS programme. No exotic breeds need to be permitted by notification in the project area.
4. In-service training of veterinary officials related to pig rearing should be instituted at Haringhata and ICT intrusion in extension services should be made mandatory.
5. The timely availability of vaccines for swine fever, foot and mouth disease and swine erysipelas (once considered exotic to India) must be considered mandatory, as these diseases are serious threat to pig farming. Ready availability of life saving veterinary drugs at the rural clinics should be ensured.
6. LPDC and ARD needed to jointly develop the short and long-term road map for finished pig trading infrastructure at the rural sector and facilitate the setting up of pork and pork products industry in the State.

7. The thumb rule for fixing up of sale price of a finished pig is 6 (six) times of the feed cost till slaughter (taking 4:1 feed conversion ratio). Depending on overhead expenditure, the feed cost and trading expenses, the minimum procurement price of industry from farmers need to be rationalized yearly so that the producer gets the reasonable profit.

Rabbit development

1. The rabbit farming endeavour in the State is rather recent and non-serious. Except at the Kalyani Farm, Govt. of West Bengal, the farming possibility has not been much explored in the field, though the quality meat and fast reproducing capability of rabbits are well known as such, awareness development among consumers and entrepreneurs should be the first prerequisite.
2. Trained technical manpower development is necessary and arrangement for training of entrepreneurs and farmers should be made at CSWRI, Avikanagar. Experienced / exposed state official, if any, needs to be deputed for specialized training on rabbit rearing and management in the country.

C. Poultry development

General recommendation

It is recommended that a standing\state-level Poultry Advisory Committee including ARD and WBUAFS representatives and senior scientists, representatives of farmers and industry should be formed by the State Government for time to time assessment of poultry research and development and specific problems that are faced by the poultry sector and suggest appropriate measures to be taken up in the interest of all stakeholders, farmers, entrepreneurs and consumers.

Specific recommendations

1. **Infrastructure for poultry and duck envelopment:** (i) The infrastructure requirements are specific but different for layer and meaty duck farms and would need proper assessment by duly constituted committee prior to funding.
(ii) To reduce dependency on other states especially for table eggs and to attract adequate investment in poultry one-time liberal grant or sufficient subsidies/incentives should be provided for infrastructure development especially for layer farms in view of the fact, that an entrepreneurs may have other more attractive avenues of investment in industry as well as in agriculture.
(iii) The State Government should urgently establish the database on all the parent stock maintained in the public and private farms, procurement

schedule of hatching eggs, chicks/ducklings and distribution/movement. The Government should also implement the guidelines to poultry farmers compulsorily and monitor the bio-security and epidemiology of avian diseases.

2. **Farming systems and parent stock:** The backyard poultry farming stands on low input-low return traditional system mostly followed by people below the poverty line (BPL), particularly and presently one of the major women SHGs vocations. These poor rural farmers should be given infrastructural aids and remunerative marketing support.

The organized public/private poultry farming is indeed based on high investment, scientific management, higher feed input-higher production and profit conscious marketing, but back yard farming is a subsidiary income generation opportunity for resource poor small and marginal farmers.

- (i) Both the poultry farming systems, the backyard and the organized public/private poultry farming need to continue as poultry farming under backyard system of rearing is one of the major sources of income of the socially under-privileged section of the society.
 - (ii) Maintenance of parent stock and their multiplication/distribution should be judiciously done in line with the State poultry breeding policy.
 - (iii) The development of other birds e.g., geese, quail, turkey, etc. will add to production of meat in the State and should be encouraged.
 - (iv) Backyard poultry should be supported through the existing chicks/ducklings distribution scheme per year with scientific approaches for sustenance of backyard farming system.
3. **Sustenance of parent stock and improvement:** (i) To remain self-reliant, every major poultry / duck breeding farm in the State should maintain and evolve genetically superior parent / commercial chicks / ducklings capable of surviving in the prevailing agro-climatic situation of the State.
 - (ii) Poultry breeding policy should be oriented to conserve the superior and or disease resistant germplasm, to control indiscriminate breeding and to provide the farmer with superior stock, which could also be regenerated at the farmers' level.
 - (iii) Initiatives should be taken to characterize and conserve indigenous germplasm and to achieve self lands for hatching egg and meat production (for both layer and broiler).
4. **Chick/duckling deficit procurement and distribution:** All poultry scheme(s) should be implemented by routing through the Department of ARD. A perspective plan to be prepared so that procurement of hatching eggs from other state and sale of day-old chicks from those hatching eggs in the State may be stopped after the end of the eleventh plan period.

5. **Health security:** (i) Strengthening of education and research in Poultry Science at the West Bengal University of Animal and Fishery Science (WBUAFAS) should be immediately taken up.
(ii) Organization of short term courses on Poultry Husbandry/ Health for the poultry farmers/enthusiastic entrepreneurs is urgently needed.
6. **Avian disease diagnosis:** (i) The Regional Disease Diagnosis Laboratory (Eastern Region) at Kolkata should be upgraded to higher Bio-Safety Level-III and the said scheme as approved under RKVY scheme should be implemented expeditiously observing modern scientific approaches. Establishment of a model wing of Avian Disease Diagnostic Laboratory should be the highest priority.
(ii) All the district diagnostic laboratories, district hospitals, sub-divisional hospitals need to have a veterinarian, specially trained on avian diseases and the laboratories should be properly equipped.
7. **Vaccines and preventive vaccinations:** (i) Short supply of poultry vaccines is a common observation in the fields and farms. Vaccine production/procurement estimates and planning need to be realistic with at least 10% cushion for exigencies. The thrust for the development/production of new generation thermostable / recombinant avian vaccines is essential.
(ii) Chickhood vaccination against Marek's Disease and RD and duck plague in ducklings should be made free of cost and mandatory.
(iii) For launching of the National Ranikhet Disease Eradication Programme, the centrally sponsored scheme in the 11th Plan should be given priority.
8. **Avian disease surveillance, forecast and monitoring:** In view of recent experiences with Avian Influenza and the geographical location of the State adjacent to the exotic Disease Corridor, West Bengal should take exceptional precaution and pro-active measures to prevent possible future outbreaks.
9. **Avian health emergencies and containment of disease disasters:** The acute shortage of trained human resources to combat the emergency situation during disease disaster has been observed in the State during the recent outbreak of bird flu.
Specifically trained emergency veterinary brigade need to be urgently raised and maintained ever ready in the State. The veterinary brigade need be equipped fully with man and material for all future calamities.
10. **Feed security:** (i) The State Government should evolve the means of providing incentives to grow the major poultry feed ingredients like maize, soybeans, etc. and or subsidize trade on groundnut, soybean and til (sesamum) and fishmeal for poultry and livestock feed for which a collaborative decision need be undertaken by the State Agriculture Department and leading feed manufacturers.

- (ii) A sustained “Grow More Maize” campaign may be introduced through a scheme of incentives to maize growing farmers.
 - (iii) Import of maize be increased and a foolproof system of distribution be laid down so that the imported maize reaches the genuine poultry farmer. A statutory higher levy for diversion of maize to nonpriority use may be considered.
 - (iv) Processing capacity in soya industries is facing scarcity of raw material, consequently prices have peaked and this scenario is likely to be repeated in the coming few years. Steps may be taken for the allotment of soybean deoiled cake (DOC) to poultry farmers more liberally.
 - (v) Initiatives may be taken for optimum development of fishmeal industries to assure supply of quality fish meal from our own sources.
 - (vi) Distribution of quality poultry feed ingredients should be effected through an agency run by GOI like FCI as is being done in case of public distribution system (PDS) under freight equalization principle.
11. **Feed compounding and feed analysis:** (i) The feed manufacturing units in the State need urgent diversification for preparing and marketing of cattle, poultry and small livestock feed. The indiscriminate use of antibiotic/coocidiostat ought to be banned immediately with encouragement of use of appropriate pro/pre-biotics.
- (ii) The realistic estimate of compounded feed (with at least 10% cushion for exigencies) requirements in the State and capacity utilization of manufacturing units need be reviewed periodically.
 - (iii) Additional set-up of units should be planned in consideration of the need of the State.
 - (iv) A chain of modern feed analytical laboratories are needed in the State which can provide on-payment services (except for BPLs) to the farmers for proximate analysis, etc.
12. **Transport of live birds and poultry produces:** (i) The transport sector so far poultry is concerned is in bad shape and sadly neglected. It is because of significant loss and needs overhauling. The cost of produce could be reduced by at least to 15% if transport losses are protected.
- (ii) The cycles, rickshaw vans, passenger bus roofs, etc. are common carriers of live birds. The birds are thickly clustered in baskets or tied *en masse* in the legs, often with heads hanging down. These are unwelcome unhygienic and appropriate alternatives should be worked out. Specialized transport vehicles should be available on public health safety considerations.
 - (iii) The sooner we switch over from inhuman sacrifice of animals in full public view in unhygienic open market place, to dressed bird and scientific/hygienic packaging and refrigerated transport, the better for everybody. The

State may constitute an Expert Committee to review the situation and act as fast as possible for public health safety and security grounds.

- (iv) The egg carriers/cartons are very much needed to be developed with strong but bio-degradable materials to avoid 20-30% transport losses.

13. Trading infrastructure, storage and marketing: This vital area has been deferred too long. Without systematic and appropriate profit oriented marketing channel and organized traders' market (with-built in infrastructure, cold storage for eggs and dressed broiler chicken/duck, marketing kiosks, etc.), the producer farmers will not be getting the remunerative price.

- (i) The Government needs to invest very significantly and very early on major and subsidiary poultry and livestock trading infrastructure in the State, if necessary with public-private participation.
- (ii) In all exigencies, the BPL poultry farmers are forced to undertake distressed sale of eggs and birds as there is no appropriate marketing structure with minimal cold storage facility in the vicinity. This is one facility which can assure minimum remunerative price to the backyard poultry farmers (mostly women SHGs) and save them from exploitation by middle men and distressed sale.
- (iii) The minimal cold storage facilities at appropriate commercially viable locations need to be created which is essential for remunerative trading of poultry and livestock produces in the villages.
- (iv) For broilers cold storages for 1000 tons each should be built in the 4 (four) major cities (Kolkata, Asansol, Siliguri, Durgapur) in the first phase. In the second phase, cold storages of smaller capacities (500 – 700 tons) may be located in major markets.
- (v) NAFED / NCDC may take up the construction of the cold storages, dressing plants and lease them to poultry farmers and (Dairypoul) farmers' societies at reasonable rates.
- (vi) Minimum support price as given in case of major cereals fiber crops, etc. there is urgent need for minimum remunerative pricing of poultry produces, eggs and broiler chicken.
- (vii) Regarding value added poultry products and fast food industry the health security standard as stipulated in WTO charter for export of human food is mandatory and specified laboratory is required to be attached to the food processing unit with HACCP (hazard analysis with critical control point)-compliance .The rapidly growing internal fast food industry in the State is no less important. The Government needs to involve/ invest on poultry/livestock food processing industry early to promote export.

(viii) West Bengal Dairy and Poultry Development Corporation may be entrusted with the responsibility of fixation of day to day price of poultry products taking into consideration of primary poultry producers' interest.

14. In-service training on poultry-farm management and technology development should be arranged on regular employment.
15. Regular training, awareness programme of the farmers, representatives of Panchayatiraj institutions especially on scientific poultry farming, disease prevention strategies and proper disposal of poultry wastes and by-products.

D. Veterinary clinics

1. Establishing well-equipped referral polyclinic in each district is recommended. These polyclinics should be manned by well qualified people conversant in handling upto date sophisticated instruments. Periodic updating of knowledge of technical personnel should be undertaken.
2. The existing State Animal Health Centres and Block Development set-ups should be better co-ordinated and equipped. Indoor facilities for large and small animals at all the State Animal Health Centres should be developed at the existing hospitals with proper infrastructural facilities.
3. Emphasis should be given on fodder production with appointment of fodder production specialists in selected districts of West Bengal.
4. Greater emphasis on holding health camps in each block should be given.
5. Establishment of a vaccine production and disease research station, prototype of the Institute of Animal Health and Veterinary Biologicals in Belgachia and another at Siliguri in north Bengal is recommended.
6. Ambulatory Clinic Van to be established in each district to cater rural clinical service at the farmers' door-step with adequate stall strength, medicinal and surgical equipments and provision for fuel.

E. Animal health investigation

1. There should be a mobile veterinary clinic attached to each of the veterinary hospitals. The mobile clinics should visit villages around the hospitals to render 24 hour service.
2. The medicines provided in the state animal health centre, block animal health centre, additional block animal health centre, animal development, aid centre, are very meager in quantity. Quantum of supply should be doubled at least.
3. In many state animal health centres there is a great demand of services of veterinarians to attend to cases at the house premises of the livestock owners. Two veterinary doctors should be posted in such hospitals.
4. Per capita availability of milk, meat and egg in West Bengal is far below the requirement indicated in the recommendations of WHO. This shortfall has to be

narrowed down. It is expected by 2020 production of milk, meat and egg may be enhanced by the application of modern scientific management practices and proper planning. So, desired budgetary provision for animal resource development of this department should be adequately increased.

5. A specialist team of veterinary professionals should be formed to deal with the problems of emerging and exotic diseases.
6. Under the existing disease prevalence scenario, followed by production of biologicals (mainly vaccines) considering the available infrastructure the development of vaccinology in three phases targeting 2010, 2015 and 2020. Simultaneously with the developmental of cellular and molecular immunology in the past two decades have propelled immunodiagnosis into the main stream of disease investigation. Demonstration of antigen in tissues/organs is one the newer areas of diagnosis currently used for confirmation of economically important infectious diseases in livestock and poultry demand improvisation of diagnostic technique.
7. The Institute of Animal Health and Veterinary Biologicals (IAH&VB), Kolkata should be suitably strengthened on a priority basis to produce vaccines as per enhanced requirement envisaged for control and eradication of major preventable diseases of domestic livestock. Another vaccine production unit may be set up in North Bengal at Siliguri to meet the huge requirement.
8. To avoid exogenous agents in the poultry vaccine and to fulfil the standard of biologicals as per OIE guidelines, all the vaccines should be manufactured from the lyophilized 'Master Seed' and then working seed should be prepared, therefore the need of establishment of seed lot system for production of biologicals in SPF embryonated hen's egg system should be given due attention.
9. For control of Ranikhet disease (RD) it is necessary to raise the target of vaccination to cover at least 80% of population within the next 5 years. Within the next 10 years 100% vaccination should be achieved. A live vaccine based on Ranikhet disease virus which is very low pathogenic heat stable but highly immunogenic may be developed particularly to combat the specific problems associated with back-yard poultry. Most important consideration is to select a seed for preparation of inactivated vaccine against RD.
10. To control foot and mouth disease (FMD) an effective vaccine should be prepared in public private participation (PPP) with reputed concerns.
11. An attempt should be made to produce an inactivated IBD vaccine using Lukert/Intermediate strain.
12. To protect fowl cholera and duck cholera a polyvalent vaccine using multiple local isolate for the same may be the choice to combat the situation.
13. To prevent different toxic materials in the feed and some vertically transmitted infectious and contagious nature of disease in commercial birds, implementation of Feed Regulation and Hatchery Regulation Act. is essential.

14. To prevent goat diseases particularly goat pox and PPR the entire goat population of the state should be covered by 'blanket vaccination' programme in the coming 5 year period. In this connection a new generation recombinant vaccine may be developed which will provide protection against capripox and PPR in a single vaccine. Similarly, to prevent swine fever throughout the state in the present day context is to produce cell culture vaccine against swine fever based on live virus attenuated by serial passages.
15. Mycotoxin assay in animal feeds including residual status of antibiotic and other insecticidal and pesticidal residues in animal feed and products should be developed and edible livestock product specially for export. The lab should be APHDA approved.
16. For enforcing the provision of drugs and cosmetic act in respect of veterinary biological products and veterinary drugs, a post of controller, veterinary biological products and drugs may be created in the state.
17. A systemic programme to control tuberculosis and brucellosis among animals with the objective of their eradication should be taken up. A specific technical programme including calf mortality, hermetic problem in goat, haemoprotozoal diseases of cattle should be carried out.
18. All municipalities of the state should engage trained veterinary public health professional in phases starting with 6 (six) corporations.
19. An effective organization to undertake systemic control of mastitis should be set up. A massive audio-visual programme should be launched to educate livestock owners regarding the economic importance of control of mastitis in dairy animals.
20. Through systemic vaccination programme effective control and ultimate eradication of anthrax and black quarter should be done in the next 10-15 years.
21. A systematic programme for control of fascioliasis (Liver fluke disease) in cattle should be launched. Research work on trematodes and nematodes particularly on ecological behaviour of the intermediate host and the effect of different moluscides on the snails and the environment should be intensified.
22. Duck rearing should be given priority in the fluke infested areas as a step towards the biological control of snails.
23. A systematic programme for control of chronic respiratory diseases of poultry should be taken up.
24. An exclusive avian disease diagnosis laboratory except HPAI with all modern facilities is required to be established under IAH&VB, Kolkata.
25. Regulations of OIE and zoo sanitary codes should be followed to control import of cultures of microorganisms, semen and veterinary biological and to enforce laboratory examination of imported livestock products like eggs, meat, cheese, butter, etc.

26. Legal provisions of Bengal Animal Disease Rules should be invoked to regulate the interstate movement of livestock to prevent the spread of diseases from other states.
27. Quarantine station should be established in sensitive Indian borders adjoining Bangladesh, Bhutan and Nepal. These may be in places close to administrative or security check posts.
28. At least 10 quarantine stations may be set up in international and interstate borders with adequate facilities for keeping animals under quarantine and for carrying out laboratory examinations.

F. Feed and fodder development

1. Promoting the farmers to put at least 10% of the total cultivable land for fodder crop production while making their crop-plan. For this area specific fodder varieties will be identified and developed.
2. Development of waste lands into community pasture lands through systematic efforts of green cover augmentation under soil and water conservation schemes with involvement of village panchayats and NGOs.
3. Promotion of fodder enrichment techniques (nutritive value addition with use of urea and molasses) shall be introduced to address the problem of fodder shortage. Promotion of techniques of treatment of straws and feed supplements as entrepreneurial activity. Toxic limit of urea should be strictly checked so that it does not affect animal and human health.
4. Mineral deficiency pattern already determined by the WBUAFS under AICRP on, "Improvement of Feed Resources and Nutrient Utilization in Raising Animal Production", should be taken up and area specific mineral supplement should be distributed to the farmers.
5. Quality parameters for cattle and poultry feed, minerals and trace minerals (for supplementation in feed) should be upgraded. Stipulated quality parameters will be made mandatory for the manufacturers through enactment and enforcement of suitable legislation. The Animal Nutrition department, WBUAFS shall be recognized as the reference laboratory for quality assessment of cattle feed produced by the various public and private sectors in the State.
6. Steps should be taken for rational distribution of food grains unfit for human consumption to the farmers for livestock feeding by the FCI.
7. All the veterinary officers in the block levels should be assigned the responsibilities of target oriented fodder production under his jurisdiction.
8. The present 'dry fodder and concentrate' oriented feeding system has to be changed into a 'green fodder plus dry fodder and concentrate' oriented feeding system for economic milk production along with mineral supplementation.

9. A large number of unconventional and some of the conventional by-products containing toxic principles which may cause harmful effect to the animal system; their possible utilization needs to be investigated. Researches conducted in India and elsewhere have brought out some good recommendation on a large number of agro industrial by-products which can be used for formulating economical feed. Adaptive research on the use of such products may be taken by the WBUAFS with suitable laboratory animal models before commercialization.
10. In every Gram Panchayat at least five fodder demonstration plots of 10 Kottahs may be established by Gram Panchayat and Azola cultivation should be promoted.
11. Special incentives should be provided to the farmers for fodder cultivation.
12. Quality seeds production of fodder crops can be done in the Govt. farms (108 hectares) of the ARD Department in a more intensive manner.
13. Initiatives should be taken for promotion of oil seed and pulse cultivation.

G. Meat processing

a) Abattoir development

1. The setting up of the state of art abattoir-cum-meat processing plants at various pockets (primarily at the sub-division level and then at block level) of West Bengal is an immediate need. These plants should be eco-friendly with adequate SPS measures and capable of utilizing by-products in a proper way. They should also adopt appropriate technologies for value addition. Initially a small number of such efforts could be made in some selected pockets where numbers of slaughter of animals (large or small) are high.
2. Qualified veterinarians specially meat technologists should be a vital link in this regard for proper management of these modernized slaughter houses, and production of wholesome and hygienic meat and effective recovery of valuable by-products. In this context, the government and the private sectors should have a cooperative attitude.
3. One of the main problems faced by the industrialists and entrepreneurs in this sector is in getting necessary permits and licenses for setting up slaughter houses and meat processing plants. Single window system formed by GOWB should act in appropriate manner to encourage establish meat processing industry.
4. To supervise the whole process from the production of meat animals to supply of meat and meat products to the consumers' level, a committee should be formed by the Government. Improvement and modernization of West Bengal Livestock Processing Development Corporation could be a guideline.
5. Every municipality should have at least one slaughter house and clandestine slaughter of animals should be stopped.

b) Poultry meat development

1. Similar approach of establishing of poultry meat processing (and further processing) units can be explored for different localities where there is higher population of broilers poultry.
2. Emphasis should be given on popularization of duck, quail, turkey, rabbit, etc. as potent meat producer.
3. An officer may be entrusted with the task of monitoring / coordinating the process of marketing of poultry, meat and egg in liaison with the state marketing network.

c) Meat processing, storage and food safety related issues

1. A food safety bill is on the anvil to be placed before the Parliament to ensure food safety to the consumers. It is expected that the unhygienic, traditional, dilapidated slaughter houses owned by the local self governments would be modernized once the food safety bill is passed. A scientific approach could be initiated to 19 such slaughter houses of West Bengal where most of them need thorough restructuring under the supervision of construction engineers and animal product technologists.
2. The development of cold chain is also an emergent need for the thriving of the meat industry in competition with those of the developed countries.
3. One of the major challenges to meat industry is the detection of permissible levels of different heavy metals and pesticides in animal products. For this, a good referral laboratory should be established. And such laboratory could cater to the need for West Bengal and other eastern and north eastern states of India. Government of India should be approached in this regard.
4. Reducing the mortality rate of male buffalo calves (80%) and rearing the animals scientifically for quality meat production which would not only improve the economic condition of the farmers but would also increase meat production for domestic consumption and export market. Two male buffalo meat production farm, one in North Bengal and another in South Bengal should be established depending upon the population of that area.
5. Through breeding and nutritional management, positive contribution may be made for increment of dressing percentage (>50%) of Black Bengal goats and enhancement of substantial amount of chevon production could also be possible. This 'National Meat Animal' deserves much more attention.
6. New feeding regimens should be developed which would increase the contents of conjugated linoleic acid (CLA) and omega-3 fatty acids in meat. These

provide multifarious health benefits such as preventing cancers, atherosclerosis, coronary heart disease, etc., delaying onset of diabetes and adiposity.

7. A training institute for animal products processing and marketing specially on pork and poultry meat should be established to promote the science and technology of value added product preparation, processing and preservation. Such training institute can attract the unemployed youth to orient themselves to self employment.
8. Last but not the least, it may also be necessary to alleviate the anxieties and concerns of the consumers regarding meat consumption and popularization of novel meat products in both rural and urban sector by undertaking suitable extension programmes.

H. Dairy development

The ultimate objective in dairy development is making availability adequate quantify of milk for direct consumption and procession sufficient quantify of milk for a wide range of dairy products that are variously consumed in the form of baby foods, curds, yogurts, ice creams, paneer, ghee, butter, channa, sweet meats, condensed milk, milk powders and innumerable other products, a good number of which are in high global demand.

The shortfall in the requirement of milk need to be met by enhanced production in which the major constrains are low productivity of milch cattle, lack of quality control and monitoring mechanisms. The commission has recommended in the chapter on Cattle and Buffalo Development the means of improvement of our genetic recourses by following the State Cattle Breeding Policy, feed and fodder improvement and improved livestock health care through awareness generation, training of stakeholders, investment in infrastructural development and sorting out administrative difficulties. Some specific recommendations pertaining to milk procurement, processing and marketing are summarized hereunder.

1. For milk procurement the Commission strongly recommends the strengthening of the Milk/Dairy Cooperative Societies in all possible ways. That include: a) R & D for commercialization of indigenous dairy products, b) Promoting dairy exports in milk deficit countries, c) Developing milk-testing infrastructure at village level, d) Promoting bulk cooling and storage, e) Eliminating of indirect taxes in milk and milk products.
2. The level of milk processing should go up to 30% of the production backed by the sufficiency in the level of production.
3. Production of traditional dairy specialties should be given due emphasis. For this the following suggestions are made: a) Progressive framers, Dairy Cooperative Society (DCS) personnel and Cluster DCS should be made aware of the benefits of production of traditional dairy products, b) They should be trained properly at a

central location as well as at their places involving minimum investment, c) Incentive in some form needs to be given to the cooperatives, d) Marketing channels of their products need to be explored, e) Private public partnership (PPP) for better packaging, preservation and marketing of the products should be given due consideration, f) Government cooperative and joint venture (JV) outlets may be used for marketing of these products, g) A core committee should be formed to monitor and guide the functioning of these units.

4. There should be an accredited laboratory at the Milk Federation level which will standardize, test adulteration, ensure food safety to the consumers and issue certificates as when necessary. To implement “Food Safety and Standards Act, 2006”, it is absolutely necessary to set up an accredited laboratory. Here also fund is a major constraint. Some fund provisions are absolutely necessary for this purpose. Regular supply of teat-bit solutions, cleaning and sanitizing chemicals, stainless steel utensils, routine checking of somatic cell count by the Milk Union field staffs must have to be ensured. Supply of milking machines, low capacity bulk milk coolers (BMCs) and automatic milk collection units (AMCUs) to the DCS should be ensured.
5. Training programmes are considered essential for the success of the dairy development programmes in the State.
 - (a) A core team comprising of selected technical representatives of the Milk Federation, State Government and University (WBUAFS) may be formed for this purpose and the team may gather needful experience from one very successful national/state level milk union of the country. This team may monitor quality of training and post training benefits.
 - (b) A Trainers’ Training Programme (TTP) should be introduced for this purpose at the Milk Federation level.
 - (c) Training of the DCS, Cluster DCS and in some cases progressive farmers for better preservation of milk, clean milk production (CMP) and traditional dairy products preparation will help them to get better remunerative prices. For this purpose, infrastructural development of Benmilk Training Centre (BTC) is very much necessary. Progressive farmers, DCS and Cluster DCS personnel should be made aware of the benefits of production of traditional dairy products.
 - (i) Training for running and maintenance of the Bulk Milk Coolers (BMCs) by the DCS people should be arranged at B T C, Berhampur. Funds for infrastructural development of BTC are also necessary for this purpose.
 - (ii) Trainings related to Gender Sensitization should be conducted at the village level, also gender sensitization training of the milk union staff is absolutely necessary, trainings of women self-help group (SHGs) should be given greater emphasis.
 - (iii) Leadership and skill development training of the milk cooperative members and employees are needed to manage the DCS properly.

- (iv) Management of Milk Unions under West Bengal Cooperative Milk Producers' Federation should be reviewed thoroughly for effective organization of primary societies of milch cattle to the best advantage of the producers for enhancement of milk production and maintenance of reproductive health of dairy cattle. These require essential supervision and management excellence with the back ground of Veterinary Science and Animal Production
6. Proper extension work at the village level for the formation of Cluster Societies is absolutely necessary so that the Milk Co-operative Society members may understand the benefits of better infrastructure and also organized marketing of traditional milk products.
 7. Research and development efforts towards solving problems in the dairy sector should get due attention from the proposed standing State-level Advisory Committee on ARD; specifically the improvement of traditional sweetmeats with an expanding global market of nonresident Indians offers an excellent opportunity for export of high quality sweetmeats.
 8. Organic milk production is gaining popularity in the developed countries. Milk produced in the vast arid and semiarid regions of India are essentially organic or near-organic in nature, the same is true for certain tracts of West Bengal in which cattle are raised mainly backyard largely grass and hay-fed, and as such should be diverted to organic farming with greater marketability of qualitatively more valuable produce that is more remunerative. This would necessitate training and capacity building and should be given due consideration.

