



GOVERNMENT OF KERALA

Abstract

Agriculture (AH) Department– Breeding policy -- Report of the committee to evaluate and formulate Breeding policy in the state of Kerala – approved – Orders issued.

AGRICULTURE(AHF)DEPARTMENT

GO(Ms) No98/08/AD

Dated, Thiruvananthapuram, 13 /6/2008

Read:-

1. G.O(MS)No.144/98/AD dated 10.7.98
2. G.O(MS)No.18/2005/AD dated 4/2/05.
3. Letter.No.C3/26177/2004 dated 9/6/08 from the Director of Animal Husbandry, Thiruvananthapuram.

ORDER

While the demand for milk and milk products is incessantly on the rise, the domestic production accounts for only 60% of the States requirement. Hence productivity enhancement among the dairy animals is inevitable. The successive quinquennial livestock census and periodical sample surveys in Kerala have revealed decline in total number bovines and the decline has also been registered in the number of crossbred cows since 2001-02.

Associated with the decline in bovine population, the total milk production has also declined. The total milk production, which had registered an annual growth rate of 4.04 percent from 1990-91 to 2001-02, had declined during the period from 2001-02 to 2004-05. The sample survey estimates and the results of the field performance recording carried out as part of the progeny-testing scheme in the Kerala indicates continued increase in the lactation yield of cows. However, the declining profitability from dairying due to the increasing cost of feed and low availability of fodder would be the major reasons for the declining bovine population resulting in reduction of milk production in the State. Average earning of agricultural labourers is increasing and presently higher than, a dairy household keeping even up to 5 crossbred cows yielding around 10 litre milk. This might disassociate many marginal farmers from dairying because of better earning fro alternate employment opportunities at reduced risk. Hence the productivity enhancement at a faster pace is inevitable for checking the dwindling bovine population of the State and resultant decline in milk production.

The results of the study conducted by a review committee deputed by the NDDB and interaction with the filed veterinarians, farmer representatives, NGOs, and other officers including faculty members of the Veterinary College, Kerala Agricultural University have indicated that the breeding policy has to be modified for meeting the current challenges in dairy sector.

Accordingly Government vide GO read as 2nd paper above constituted an Expert Committee to review the existing Breeding Policy in the state and suggest changes thereto with the following members.

- i. Secretary(AH & Dairying)Government of Kerala as Chairman
- ii. Director of Animal Husbandry, Thiruvananthapuram(Convenor)
- iii. Dean, COVAS, Mannuthy

- iv. Director of Dairy Development, Thiruvananthapuram
- v. The Managing Director, Kerala Cooperative Milk Marketing Federation
- vi. The Managing Director, Kerala Livestock Development Board
- vii. Managing Director, Meat Products of India
- viii. An expert from National Dairy Development Board
- ix. Representative from the Ernakulam Regional Co-operative Milk Producers Union
- x. Two farmers will also be coopted to the committee as and when required.

Apart from the above members, a new committee has also been reconstituted with Dr.A.E.Nivsankar,Dr.B.R.Mangarker,Dr.G.Kishore from NDDB.

The committee after detailed study of all aspects of the Livestock Breeding Programmes and policies and after having held discussions with all the stakeholders including Dairy farmers and Government Departments, formulated the final report.

Government after having examined and discussed the report in detail with the members of the Committee, are pleased to approve the same as the Cattle Breeding Policy of the state 2008 which is appended.

(By Order of the Governor)

K.RAAMAMOORTHY
PRINCIPAL SECRETARY

To

- The Director of Animal Husbandry, Vikas Bhavan, Thiruvananthapuram(10 copies)
- The Director of Dairy Development, Pattom, Thiruvananthapuram(10 copies)
- The Managing Director, Kerala Livestock Development Board, Thiruvananthapuram(10 copies)
- The Managing Director,Kerala Co-operative Milk Marketing Federation, Pattom Thiruvananthapuram(5 copies)
- The Registrar Kerala Agricultural University,Thrissur (with C/L 10 copies)
- Private Secretary to Minister(Food&Civil Supplies and AH)
- The Secretary, Planning Board, Thiruvananthapuram
- The Managing Director, Meat Products of India, Koothattukulam, Ernakulam
- ✓The Director of Public Relations, Thiruvananthapuram
- The Managing Director, Thiruvananthapuram Regional Co-operative Milk Producers Union, Thiruvananthapuram
- The Managing Director, Ernakulam Regional Co-operative Milk Producers Union, Ernakulam.
- The Managing Director, Malabar Regional Co-operative Milk Producers Union, Kozhikode
- All Members of the Committee
- The Principal, Information Office, Farm Information Bureau, Thiruvananthapuram
- The Animal Husbandry Commissioner, Ministry of Agriculture, Department of Animal

Husbandry & Dairying), Krishi Bhavan, New Delhi(with CL) (10 copies)
The Agricultural Production Commissioner
The Principal Secretary, Animal Husbandry
The Head, National Dairy Research Institute, Southern Regional Station, Adugodi,
Bangalore - 560 030
National Dairy Development Board, Anand,Gujarath-388 001.
The Finance Department/The Secretary to the Chief Minister
The Private Secretary to Minister(Finance)
The Stock File/Office copy

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Section Officer



GOVERNMENT OF KERALA

**BREEDING POLICY
2008**



DEPARTMENT OF ANIMAL HUSBANDRY



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Associated with the decline in bovine population, the total milk production has also declined. The total milk production, which had registered an annual growth rate of 4.04 percent from 1990 – 91 to 2001 – 02, had declined during the period from 2001 – 02 to 2004 – 05. The sample survey estimates and the results of the field performance recording carried out as part of the progeny testing scheme in the Kerala indicates continued increase in the lactation yield of cows. However, the declining profitability from dairying

due to the increasing cost of feed and low availability of fodder would be the major reasons for the declining bovine population resulting in reduction of milk production in the State. Average earning of agricultural labourers is increasing and presently higher than, a dairy household keeping even up to 5 crossbred cows yielding around 10 litre milk. This might disassociate many marginal farmers from dairying because of better earning from alternate employment opportunities at reduced risk. Hence the productivity enhancement at a faster pace is inevitable for checking the dwindling bovine population of the State and resultant decline in milk production.

The results of the study conducted by a review committee deputed by the NDDB and interaction with the field veterinarians, farmer representatives, NGOs, and other officers including faculty members of the Veterinary College, Kerala Agricultural University have indicated that the breeding policy has to be modified for meeting the current challenges in dairy sector.

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Sd/-

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The Private Secretary to Minister (Finance)

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Chapter 1

BREEDING POLICY AND PROGRAMMES - 1998

The breeding policy and programmes recommended by the committee to evaluate and formulate the same in 1998 are summarized below:

1. Considering all aspects and the liking of the farmers in the State it is proposed that only Jersey and Holstein Friesian be used as exotic donor breeds and Jersey and its crossbred lines is used in larger proportions.
2. It is proposed that the level of exotic inheritance be limited to around 50%. However for commercial dairy farmers semen of high value pure breeds and proven Sunandini bulls shall be made available using the existing premium bull AI programme.
3. The committee does not recommend any change in the present bull selection programme.
4. As crossbreeding is picking up momentum in other parts of the country, it would be possible to get crossbred bulls from other sources before long. This possibility should be explored on a regular basis.
5. The programme of F_1 bull calf production using superior quality semen of Jersey and Holstein Friesian breeds imported from abroad on zebu cows should be strengthened.
6. The committee proposes to replace around 20% of the exotic bull stock annually with exotic bulls of higher genetic merit and preferably from unrelated sources.

7. It is recommended to incorporate embryo technology also in the production of breeding bulls used for AI in the State.
8. The committee recommends culling and removing about 2% of the Sunandini population for poor milk production and 1% for delayed first calving age annually adequately compensating the loss of the owners.
9. The committee proposes to include proven bulls of the PT programme also in the premium bull list and to use them extensively among elite cows.
10. The disparity in the availability of AI center between north & south may be eliminated by relocating the available center and taking proper care while allotting new centers.
11. The mobile AI programme may be implemented in all AI centers by the close of the 9th Five Year Plan in a phased manner.
12. It is important and essential that the AI technicians are subjected to refresher courses on a regular basis, at least once in 5 years.
13. The quality of the semen doses should be checked the level of the Regional Semen banks before being distributed to the AI centers. Random samples of semen doses may also be checked by drawing samples from the AI centers on a regular basis for bacterial load, motility etc.

14. The committee proposes to take urgent and intensive measures to sterilize the unselected breeding bulls used for natural services in all areas where AI facilities are provided by invoking the provisions of the livestock improvement act 1961.
15. The present system of providing pedigree details of the bulls whose semen is supplied for AI may be strengthened and details also supplied to the farmers by redesigning the present receipt form incorporating these details as well.
16. The farmers' training programmes may be strengthened and expanded for providing know how on easy to adopt scientific management packages.
17. Fodder production programme needs a thorough restructuring with the involvement of the grama panachayats so that good quality fodder is made available to the cattle.
18. It is recommended that the special livestock breeding programme be expanded to cover at least 15% of the female calves born in the State annually.
19. A massive programme to achieve 'zero sterility' should be launched for improving the reproductive efficiency of the cattle.
20. It is proposed to establish 'Pasubhavans' in selected areas to be expanded in a phased manner to collect information on the production and productivity of the livestock sector.
21. The buffalo breeding programme should be continued using superior Murrah bulls.

22. The breeding programme for goats may be strengthened by supply of superior bucks and does and providing AI service.
23. The committee proposes to constitute a coordination committee with following members to oversee the progress of the breeding operations and to identify and recommend areas for applied research.
- Secretary (AH & Dairying), Government of Kerala, Chairman
 - Director of Animal Husbandry, Kerala
 - Dean, College of Veterinary & Animal Sciences, Mannuthy
 - Managing Director, KCMMF
 - Managing Director, KLDB
 - A reputed scientist specialized in animal breeding
24. The following R & D programmes shall be taken up
- karyotyping of bulls used in AI
 - parentage control of breeding bulls
 - studies to find out the percentage of various solids in the milk of crossbred cows
 - project for germplasm preservation
 - studies to find out the impact of the breeding operations and the economics of milk production

Chapter 2

BREEDING POLICY AND PROGRAMMES - 2008

RECOMMENDATIONS/ MODIFICATIONS IN THE EXISTING POLICIES

While the demand for milk and milk products is incessantly on the rise, the domestic production accounts for only 60% of the States requirement. Hence productivity enhancement among the dairy animals is inevitability. The successive quinquennial livestock census and periodical sample surveys in Kerala has revealed decline in total number of bovines and the decline has also been registered in the number of crossbred cows since 2001-02. The dynamics of bovine population indicates that the number of bovines decreased from 3753 thousand in 1987 to 2187 thousand in 2003. In the same period the total adult females had declined from 1826 thousand to 1067 thousand and the breedable female from 2129 thousand to 1341 thousand. Steep decline was also registered in buffalo population and it has declined from 214 thousand in 1987 to 64.7 thousand in 2003.

Associated with the decline in bovine population, the total milk production has also declined. The total milk production, which had registered an annual growth rate of 4.04 percent from 1990-91 to 2001-02, had declined during the period from 2001-02 to 2004-05. The sample survey estimates and the results of the field performance recording carried out as part of the progeny testing scheme in the Kerala indicates continued increase in the lactation yield of cows. However, the declining profitability from dairying due to the increasing cost of feed and low availability of fodder would be the major reason for the declining bovine population resulting in reduction of milk production in the State. Average earning of agricultural labourers is increasing and presently higher than a dairy

household keeping even up to 5 crossbred cows yielding around 10 litre milk. This might disassociate many marginal farmers from dairying because of better earning from alternate employment opportunities at reduced risk. Hence the productivity enhancement at a faster pace is inevitable for checking the dwindling bovine population of the State and resultant decline in milk production.

The results of the study conducted by a review committee deputed by the National Dairy Development Board as per the request of the State and interaction with the field veterinarians, farmer representatives, NGOs, and other officers including faculty members of the veterinary college have indicated that the breeding policy has to be modified for meeting the current challenges in dairy sector. The modification to be made in the Breeding Policy last modified in 1998 is summarized below.

1. Breeding Policy and strategies

1.1. Breeds to be used

In Kerala, Brown Swiss breed was used initially for crossbreeding works and Jersey and Holstein Friesian were introduced later as the donor breeds of inducing genes for productivity. As per the breeding policy in force, the use of donor breed has been narrowed to Jersey and Holstein Friesian. Crossbreds of Jersey are being used in larger proportions. However for farmers and areas where feeding is less expensive and more roughage based, Holstein Friesian had been recommended as suitable donor breed.

Studies undertaken as part of reviewing the breeding policy indicates a presence of larger proportion of cows with Jersey as the donor breed and also a preference for the same breed. Since Holstein Friesian is a breed with higher productivity of fluid milk compared to Jersey and as the expected per day yield from animals is more than 15 litres in more than 28% of

respondents of this study, **Holstein Friesian** would be the choice of donor breed in such instances.

Considering all aspects and **keeping in mind the responses** from different stake holders including the farmers in the State, it is proposed that only Jersey and Holstein Friesian will continued to be used as exotic donor breeds.

In the responses received through survey conducted by the review committee, it is **seen** that the smallholders with low resources prefer Jersey, while the commercial herds preferred Holstein Friesians as donor breed. In any given zone/jurisdiction area of artificial insemination centre there are an array of management systems and they consists of both the low and high input farming systems. Hence it is recommended that the farmers would be given the choice to select the semen from bulls based on the donor breed used for production of the bull.

1.2. The level of exotic inheritance

In deciding upon the level of exotic inheritance it is essential to find a balance between the **level of production potential** and the adaptability to the agro-climatic conditions prevailing in the field. Kerala is by and large having a hot-humid climate and hence the level of input availability would be the deciding factor. It is observed that there is **preponderance** of smallholdings in Kerala, where the resources available are less. Considering the views of the farmers, professionals and scientists in the sector and the findings of the review committee, it was evident that increasing the average exotic inheritance above 50% in the smallholding population would not **commensurate** increase in productivity and profitability without adequate **improvement** in the environmental factors. Hence it is proposed that the level of exotic inheritance

be limited to around 50% in the small holding population. The productivity in this population would have to be enhanced through gearing up the selection of crossbred bulls used in the breeding programme.

In the State there are also small farmers with good resources and farmers involved in commercial/semi commercial dairying. These farmers will be able to maintain animals of higher exotic inheritance and their expectation of daily milk yield per cow is high. It is recommended to provide these farmers with semen of high value pure breeds Holstein Friesian bulls. However, indiscriminate use of such semen could be counter productivity. Hence it is recommended to use the semen of such pure breed Holstein Friesian under close monitoring by the State Animal Husbandry Department and the Kerala Livestock Development Board. It is recommended to use such bulls for cows registered under State run programmes like "Ksheeradharma" and "Gorekha".

2. Genetic evaluation and bull production

2.1. Introduction of Superior Indigenous germplasm from outside source

It is noted that there is significant increase in average milk productivity of animals over past two decades. The compounded annual growth rate of daily wet average of milk has been 3.23%, 2.34% and 4.70% in indigenous cows, crossbred cows and buffaloes respectively in the period 1990-91 to 2003-04. This could be partly attributed to the improved management and partly due to genetic improvement. However, results of integrated sample survey indicates a decline in annual growth rate of wet average during 1994-95 to 2003-04 compared to 1985-86 to

1994-95. This may or may not be due to certain level of inbreeding in the crossbred population.

In order to increase the genetic diversity in the population it is recommended to introduce F1 crossbred bulls produced by using donor exotic breeds on famous indigenous breeds like Sahiwal. The F1 bull calf procurement and production programme using Sahiwal cows and semen from exotic bulls of Jersey and Holstein Friesian origin should be strengthened.

2.2. Introduction of crossbred bulls from other parts of the country

Crossbred bulls are available in other States of India, but many of them are used in totally different agro-climatic zones. Introduction of superior crossbred bulls from other part of the country could be beneficial in enhancing the genetic diversity and induction of beneficial genes in the population. However, the crossbred used in the State are born to bulls and elite cow, which had proven records in the prevailing agro-climatic situation of the state. Hence it is essential that the crossbred bulls introduced from outside the State have produced progenies that were born and performed in hot humid climate with similar management systems prevailing in Kerala. It is also essential that these progenies were recorded under a field performance recording programme.

In absence of performance record under similar agro-climatic conditions as in Kerala, such bulls shall be put to test under the existing progeny testing programme of the State before using them in the population.

Considering the above factors it is recommended to use crossbred bulls of high genetic merit available in other parts of

country after assessing the performance of their daughters either in Kerala or in field conditions in other parts of country having similar agro-climatic conditions as prevailing in the State.

2.3. Replacement of bulls of donor breed

In order to widen the genetic base and to infuse superior germplasm from exotic donor breeds of Jersey and Holstein Friesian it is essential to replace bulls of exotic origin periodically. It is recommended to replace around 20% of the exotic bulls used for FI bull production on annual basis with those having high genetic merit and preferably from unrelated sources, qualifying to minimum standards for milk quality parameters like fat percentage.

2.4. Progeny testing of bulls

Progeny testing programme is the most important tool for bull selection especially when it is associated with a field performance recording programme so as to assure the adaptability component. This system is superior to any other alternative in identifying the superior sires with reliable accuracy. Kerala had been pioneer in developing a field performance recording programme and has been conducting progeny testing since 1977 with the assistance from the Government of India. The results obtained from the milk recording areas in the State indicate that there has been an average annual increase of 56 kg milk in the first standard lactation yield from 1991 to 2003.

The young crossbred bull (Sunandini bulls) numbering around 40 annually are test mated each year by the Kerala Livestock Development Board. The female calves born to the test mating are identified, registered and followed up till the completion of

their first lactation. Breeding value estimation of the test bulls is done and the top ranked proven bulls are used as sires for the production of next generation bulls. The top cows in the field performance recording area under the progeny testing scheme are identified as the bull mother and they are subjected to nominated mating using the top proven bulls for bull calf production.

Considering the results of the programme over the last years it is recommended to continue the programme with following improvements.

2.4.1. Expanding the area under field performance recording

The progeny testing is presently done utilizing a field performance recording area established in Idukki, Kottayam and Alapuzha Districts. The review committee in the analysis has identified at least two different zones in the State distinctly different with regard to resource availability, management systems and productivity. In future it would be essential to have different set of bulls for different zones of the state based on productivity of their progenies in the respective zone.

Hence it is recommended to expand the field performance recording area under progeny testing scheme to all possible parts of the state.

2.4.2. Utilize latest statistical tools for sire evaluation

The latest tools like BLUP and Animal Model are not being used for evaluation sire in the State. In order to be in line

with the international standards and to bring in more weightage for the progeny testing evaluation, it is recommended to adopt latest methods of sire evaluation like BLUP or Animal Model.

2.4.3. Incorporate milk quality parameters in bull selection

The review committee has observed that there is a need to emphasize milk quality parameters like butter fat percentage while selecting bulls to commensurate with market requirements. This would also help farmers in increasing the returns from milk marketed. Presently the fluid milk trait is taken as the criterion for breeding value estimation of bulls.

2.4.4. Selection for physical traits

Some physical traits like udder quality, size and symmetry are known to be related to milk production, incidence of mastitis and productive life. Hence it is recommended to include these physical traits in the bull selection programme.

2.5. Parentage test

The improvement of the dairy animals of Kerala largely depends on the bulls used for breeding. Hence it is essential to know the parentage of the bulls selected for the breeding programme. It is recommended that all the male calves that are either produced or procured by the Kerala Livestock Development Board to be reared as future breeding bulls be subjected to parentage test using molecular technology to confirm their pedigree.

2.6. Reducing the generation interval in bull production programme

It is observed that the age at first calving under field condition of Kerala is far from optimum. This in turn increases the generation interval in bull production programme resulting in reduction of genetic improvement. The Special Livestock Breeding Programme implemented in the State, wherein female calves are provided with feed at subsidized rate, has shown to have positive impact in reducing the age at first calving. In order to reduce the age at first calving the following recommendations are made.

- 2.6.1. Expand the Special Livestock Breeding Programme to cover all the areas under progeny testing incorporating all the female calves born to test bulls.
- 2.6.2. Strengthen embryo transfer technology for bull production programme by using the crossbred cows in the farms that do not qualify as bull mothers

2.7. Buffalo breeding

The total buffalo population that was around 215 thousand in 1977 has progressively declined to around 65 thousand in 2003. Although the milk production performance of the buffaloes are satisfactory, the results of survey results conducted by the review committee reveals unwillingness of farmers in rearing buffalo mainly because of difficulty in management and non-availability of good animals.

In consideration of this background it is recommended that the existing grading up programme for buffaloes with Murrah is

continued using superior bulls procured from the native tract of Murrah.

3. Artificial Insemination Delivery

3.1. Zone wise intervention

The available information from the survey conducted by the review committee reveals the presence of at least two different zones in the State, distinct with respect to the milk production resource availability, awareness level, AI accessibility and market. The Northern Zone (Zone 1) comprising of Kasargod, Kanoor, Wynnad, Malapuram, Palakkad and Idukki has lower producing animals, but has shown better compounded growth in wet average during last decade. In all the districts of this zone excluding Palakkad, the AI access and awareness are reported to be less as per recent survey. Palakkad district is observed to be a rearing station for female calves due to better resources.

Considering the above factors, it is recommended that intensive efforts from all stake holders be targeted to improve this progressive Zone.

3.2. Number of AI centres

The AI centres in the State has increased to around 2971 by 2004-05 from 1541 during 1990-91. On an average, the existing centres cover a breeding population of 550 per centre. The increase in AI centres and reduction of breedable animals per centre is not seen to improve the efficiency as expected, based on available data. It is noted that the existing breedable bovines in the State can be covered by around 1400 AI centres if each centre can cover 1000 breedable females.

It is recommended to reduce the AI centres in a phased manner so as to improve the efficiency and quality of frozen semen distribution system to the AI centres and reduce the expenditure on AI delivery, which could be utilized for other improvement programmes

3.3. Re-allotting AI centres among Zones

The results of the survey by the review committee reveals deficit in AI accessibility in most of the District in Zone I or the Productive Zone. It is inferred that there is opportunity for re-allocation of AI centres to facilitate wider and efficient delivery systems with the existing numbers. It is recommended to reallocate the AI centres among the Zones to improve the AI accessibility in Zone I

3.4. Increasing efficiency of AI

Calving interval is an important trait that relates to profitability of farmers. The calving interval in Kerala is higher, which can be improved by timely insemination at the doorstep of the farmers. The preference for having AI at doorstep is also evident from the survey conducted by the review committee, since doorstep AI is reported to give better conception result and freed them from botheration of taking the animals to AI centre.

Considering the convenience of the farming community and the economic advantages, it is recommended that all AI be exclusively offered at the doorstep of the farmers. Appointment of trained persons on contract through State Animal Husbandry department or Kerala Livestock Development Board may be considered if essential for ensuring doorstep AI.

3.5. Providing pedigree details

The pedigree details of bulls whose semen is used in each AI centre is provided by Kerala Livestock Development Board. It is recommended to continue this practice and also explore the possibility of providing the farmers with the option to choose the bull, semen of which is available in stock at the AI centre.

3.6. Premium AI programme

The bull selection programme in the State is a young bull programme wherein the proven bulls are used for production of next generation bulls. Use of semen from such proven bulls in the field could improve the milk production of the State due to lowering of the generation interval, especially when they are used in high producing cows.

It is recommended to identify the high producing cows in all AI centre through the "Gorekha" programme of the State and provide them with Premium semen produced by the proven bulls. If such cows are identified by the State Animal Husbandry department or the Kerala Livestock Development Board to be maintained under high input system with ample resources, they may be provided with pure exotic semen from Jersey or Holstein Friesian breeds as found suitable for the area.

4. Quality Assurance

4.1. Minimum Standards for Production of Frozen Semen

The Government of India has fixed minimum standards for production of frozen semen. It is recommended that the Minimum Standards for Production of Frozen Semen is abided to while replacement of bulls is done. The minimum standards would

also have to be abided by the frozen semen production station in all their activities

4.2. State level Regulatory Authority

The breed improvement programme involves several activities like selection of breeding stock, production and use of frozen semen, delivery of AI services, following the breeding policy, genetic evaluation etc. The activities are vastly spread, technically complicated and sensitive activities, which require proper coordination and control on quality of inputs and outputs

In order to monitor and control the varied activities it is recommended to constitute a "State level Regulatory Authority". All the activities related to AI operations of the State including import of semen/animal/embryos, quality checking of the semen doses, setting up standards and certification for bulls/semen/embryos, licensing of AI technicians, implementing of breeding policy etc. could be monitored by this Regulatory Authority.

4.3. Control of scrub bulls

The livestock census in 2003 indicates presence of 42000 adult bovine males. Even though the intension for their maintenance is not sure, it is inferred that the most of these are scrub bulls, which would hinder with the breeding programme. Hence it is recommended that the State level Regulatory Authority initiate urgent step to license breeding bulls essential for the State and direct intensive measures to sterilize other bulls, unfit for breeding purpose.

5. Training

5.1. Refresher training programme for AI technicians

The success of the breeding policy depends on the effective AI services. The genetic improvement developed in the bulls is expressed in the female population only through the female progenies which involves a large number of AI technicians spread across the State. Periodic up gradation of the knowledge and skill of the AI technicians is compulsory for the out come of any genetic improvement programme.

It is recommended to make refresher training of AI technicians, whether in private or Government sector, once in three years mandatory. The training would be under monitoring of the State level Regulatory Authority

5.2. Farmers awareness and training programme

The awareness level of farmers regarding the correct method of AI and AI delivery systems are essential. It is recommended to conduct regular farmer awarness programmes through electronic and other mass media. Visual clipping could be regularly telecasted in television to ensure timely AI and to make them aware about it, which is important for the success of the breeding programme. Success also depends on the correct method of doing mobile AI.

It is also recommended to conduct periodic farmer training programmes with emphasis on improved management of dairy animals to maximize the expression of genetic potentials.

6. Information Systems and monitoring:

6.1. Gorekha

The "Gorekha" programme implemented in the State for enrollment of crossbred cows under Herd book is with the objective of collecting baseline information on performance of dairy animals, assisting farmers in taking management decisions, establishing long term genetic improvement programme, identifying elite animals and helping farmers in taking culling decision and assisting them in marketing of animals.

It is recommended that the Gorekha programme is strengthened and continued with the objective of establishing a herd book of dairy animals and later institutionalizing breeders associations. The elite cows identified under the programme should performance recorded for authenticity and should be used for producing the replacement stock of females in the population by providing them with premium semen.

The availability of feedback information regarding conception rate, AI index, calving rate etc. are observed as inadequate by the review committee. The timely feedback is essential for taking corrective steps at appropriate time and to assess the results of the breeding policy. It is recommended to develop a proper information system for recording and follow up of the AI operations and to make proper use of the system mandatory at all level. It is also recommended to properly identify all the animals. "State Level Regulatory Authority" could be entrusted with the development and implementation of a suitable information system.

7. Research and Development

The survey conducted and responses received from various stakeholders have revealed the need for further studies in many areas. It is recommended that the Kerala Agricultural University in coordination with different other stakeholders should undertake following R & D programmes:

- ✓ Studies to find out the percentage of various solids in the milk of different genetic groups of crossbred cows.
- ✓ Comparative studies on adaptability traits of different groups of crossbreds.
- ✓ Molecular characterization of local genetic resources like Vechur, coastal cattle of Kerala and Kuttanad Buffaloes for germ plasm conservation.
- ✓ Studies to find out the economics of milk production under different farming systems and agro climatic zones.
- ✓ Studies to compare the productivity of different genetic groups of crossbred cattle under field conditions.
- ✓ Study the reasons for progressive decline in Buffalo population, the farmer's perspective.
- ✓ Studies to estimate the inbreeding level and its effect on the productivity under the farm and field conditions.
- ✓ Studies to identify suitable high yielding varieties of fodder and developing package of practices for their cultivation.

It is recommended that the implementing agencies should approach the research organizations like Kerala Agricultural University, Centre for Development Studies (CDS) for solving field related issues concerning dairying.

Chapter 3

BREEDING POLICY AND PROGRAMMES – 2008

SUMMARY

The Breeding Policy recommended by the committee to evaluate and formulate breeding policy in the State, based on the recommendations of 1998 and the findings presented at chapter 2 and approved by Govt. of Kerala is summarized below:

1. Considering all aspects and keeping in mind the responses from different stake holders including the farmers in the State, it is proposed that only Jersey and Holstein Friesian will continued to be used as exotic donor breeds. two lines of Sunandini would be developed based on the preponderance of exotic inheritance in the animals, viz Jersey line and Holstein line. The farmers would be given the choice to select the semen from bulls based on the donor breed used for production of the bull. Farmers would also be made aware about the two lines and requested to cooperate so that the two lines are not crossed.
2. The level of exotic inheritance be limited to around 50% in the small holding population. But the small farmers with good resources and farmers involved in commercial/semi commercial dairying could be provided with semen of high value pure breeds Holstein Friesian bulls under close monitoring by the State Animal Husbandry Department and the Kerala Livestock Development Board. It is recommended to use such bulls for cows registered under State run programmes like "Ksheeradhara" and "Gorekha". In all the cases germplasm provided by KLD

Board alone may be used in the state and it should be under the supervision of Director of Animal husbandry.

3. The committee recommends continuing of the present bull selection programme with following modifications.
 - a. It is recommended to expand the field performance recording area under progeny testing scheme to all possible parts of the state.
 - b. It is recommended to adopt latest methods of sire evaluation like BLUP or Animal Model.
 - c. The committee has observed that there is a need to emphasize milk quality parameters like butter fat percentage while selecting bulls
 - d. It is recommended to include physical traits like udder quality, size and symmetry in the bull selection programme.
4. In order to increase the genetic diversity in the population it is recommended to introduce F1 crossbred bulls produced by using donor exotic breeds on famous indigenous breeds like Sahiwal.
5. It is recommended to use crossbred bulls of high genetic merit available in other parts of country after assessing the performance of their daughters either in Kerala or in field conditions in other parts of country having similar agro-climatic conditions as prevailing in the State.
6. It is recommended to replace around 20% of the exotic bulls used for F1 bull production on annual basis with those having high genetic merit and preferably from unrelated sources, qualifying to minimum standards for milk quality

parameters like fat percentage. A minimum standard of 4% fat for Jersey and 3.8% fat for Holstein Friesian is recommended.

7. Committee recommends that all the male calves, which are either produced or procured by the Kerala Livestock Development Board to be reared as future breeding bulls, be subjected to parentage test using molecular technology to confirm their pedigree.
8. It is recommended to strengthen embryo technology in the production of breeding bulls used for AI in the State by using cows of farms that have not qualified to become bull mothers as the recipients.
9. The committee recommends culling and removing about 2% of the Sunandini population for poor milk production and 1% for delayed first calving age annually. The State could produce superior heifers through nominated mating in elite cows identified in farms and field and use them for replacement. In any programmes planned by government for such replacement, farmers willing to replace poor yielders may be given preference, thus compensating the loss of the owners.
10. It is recommended to identify the high producing cows in all AI centre through the "Gorekha" programme of the State and provide them with Premium semen produced by the proven bulls. If such cows are identified by the State Animal Husbandry department or the Kerala Livestock Development Board to be maintained under high input system with ample resources, they may be provided with

pure exotic semen from Jersey or Holstein Friesian breeds as found suitable for the area.

11. Emerging commercial/semi commercial dairy farms would be encouraged by providing technical support and high quality breeding inputs.
12. Considering the disparity in one of the zone among the two identified in the State, comprising of Kasargod, Kanoor, Wynnad, Malapuram, Palakkad and Idukki, it is recommended to intensive efforts from all stake holders targeting at the improvement of this Zone.
13. It is recommended to reduce the AI centres in a phased manner so as to improve the efficiency and quality of frozen semen distribution system to the AI centres and reduce the expenditure on AI delivery, which could be utilized for other improvement programmes
14. Observing the disparity in AI services among two zones identified in Kerala, it is recommended to reallocate the AI centres among the Zones to improve the AI accessibility in Zone comprising of Kasargod, Kanoor, Wynnad, Malapuram, Palakkad and Idukki.
15. Considering the convenience of the farming community and the economic advantages, it is recommended that all AI be exclusively offered at the doorstep of the farmers.
16. It is recommended to make refresher training of AI technicians, whether in private or Government sector, once in three years mandatory.

22. As part of farmers' awareness programme regular telecast of visual clipping in television is recommended to ensure timely AI and to make farmers aware the correct method of mobile AI.
23. It is recommended to conduct periodic farmer training programmes with emphasis on improved management of dairy animals to maximize the expression of genetic potentials.
24. Fodder production programme is observed to be not picking up well. It is recommended to strengthen the programme thorough the involvement of the Grama Panachayats. Steps would also be initiated to ensure un-interrupted supply of quality feed.
25. It is recommended that the special livestock breeding programme be expanded to cover maximum of the female calves born in the State annually. It is further recommended to expand the programme to cover all the areas under progeny testing incorporating all the female calves born to test bulls.
26. The efforts to achieve 'zero sterility' are recommended to be strengthened for improving the reproductive efficiency of the cattle.
27. It is recommended that the Gorekha programme is strengthened and continued with the objective of establishing a herd book of dairy animals and later institutionalizing breeders associations. The elite cows identified under the programme should be used for producing the replacement stock of females in the population by providing them with premium semen.

28. In consideration of unwillingness of farmers in rearing buffalo mainly because of difficulty in management and non-availability of good animals, it is recommended that the existing grading up programme for buffaloes with Murrah is continued using superior bulls procured from the native tract of Murrah.

Conservation programmes of native swamp type buffaloes would be initiated and the *insitu* programmes would be carried out jointly by State Animal Husbandry department and Kerala Livestock Development Board in association and with guidance from Kerala Agricultural University.

29. The breeding programme for goats may be strengthened by supply of superior bucks and does and providing AI service. Performance recording and Malabari breed improvement programmes would be initiated
30. Conservation programmes of native breeds of all livestock in the state would be intensified and the programmes would be carried out jointly by State Animal Husbandry department and Kerala Livestock Development Board. Associated research activities would be carried out by Kerala Agricultural University. The native breeds available would be kept in their pure form by providing suitable assistance to farmers involved in keeping such animals.
31. It is recommended that the implementing agencies should approach the research organizations like Kerala Agricultural University, Centre for Development Studies (CDS) for solving field related issues concerning dairying. The following R & D programmes shall be taken up

- ✓ Studies to find out the percentage of various solids in the milk of different genetic groups of crossbred cows.
- ✓ Comparative studies on adaptability traits of different groups of crossbreds.
- ✓ Molecular characterization of local genetic resources like Vechur, coastal cattle of Kerala and Kuttanad Buffaloes for germ plasm conservation.
- ✓ Studies to find out the economics of milk production under different farming systems and agro climatic zones.
- ✓ Studies to compare the productivity of different genetic groups of crossbred cattle under field conditions.
- ✓ Study the reasons for progressive decline in Buffalo population, the farmer's perspective.
- ✓ Studies to estimate the inbreeding level and its effect on the productivity under the farm and field conditions.
- ✓ Studies to identify suitable high yielding varieties of fodder and developing package of practices for their cultivation.