

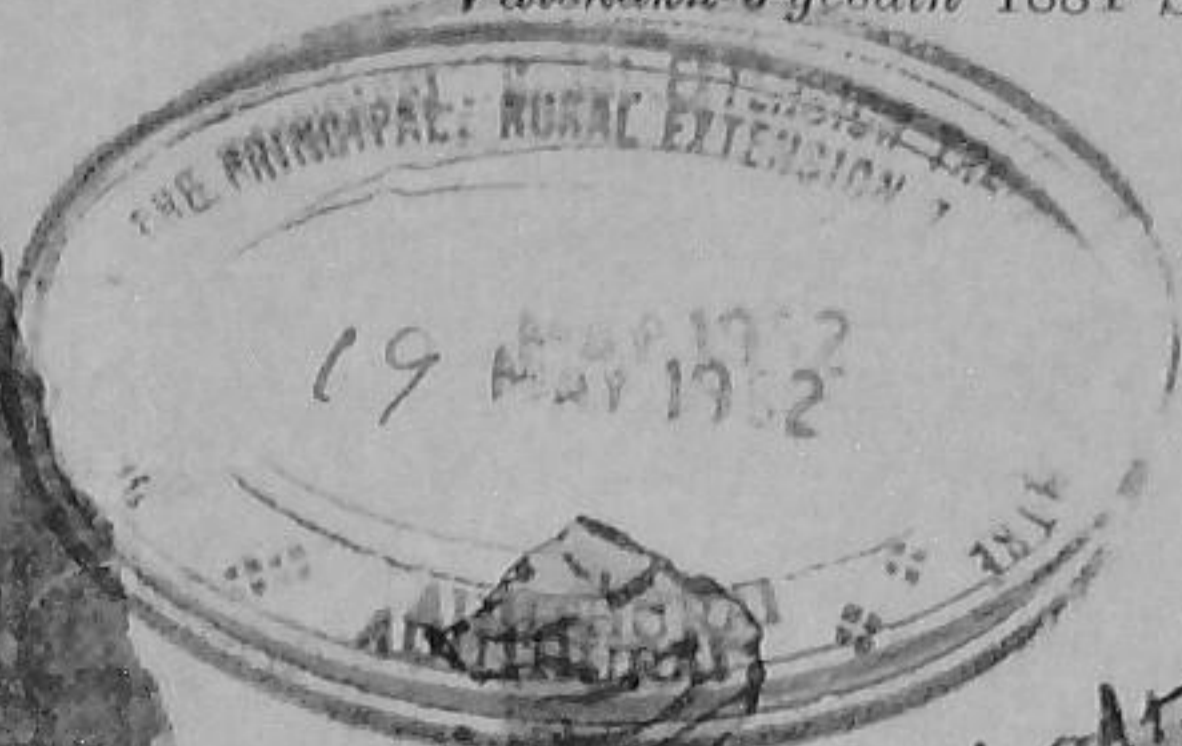
# GOSAMVARDHANA

Vol. X

No. II

MAY 1962

*Vaishakh-Jyeshath 1884 Saka*



News from  
Newspapers

This feature comprises material reproduced/abstracted from the daily newspapers.

## Cattle Uplift

*THE* provisional estimates of the 1961 all-India census of livestock just released by the Union Ministry of Food & Agriculture reveal a rate of growth of the country's bovine population that can scarcely be regarded with equanimity. The number of cattle has gone up by 10.7 per cent to 175.67 million during the past quinquennium and the number of buffaloes by 13.9 per cent. to 51.14 million. The extraordinary pressure that this increase imposes on the nation's resources is seen in the fact that India's bovine population constitutes more than a quarter of the world's total and that there is a cow or buffalo in the country for every two Indians. The country's milk production went up from about 19 million tons to 22 million tons during the second plan period, but milk yields, like agricultural yields generally remain among the lowest in the world.

The reason is well known. A large part of our cattle consists of diseased and infirm animals which compete with good stock for the limited fodder and grazing that is available. Indian species are internationally famous and pedigree Kankrej and Ongole bulls have been imported by the Soviet Union and Brazil even in recent years for breeding purposes. We have however denied ourselves this benefit as a result of ambivalent attitude towards cattle upliftment through a humane and scientific policy of restricting numbers. It is officially recognised that this can be achieved without hurting any body's susceptibilities by castrating all stray and useless animals. Once this is done breeding will become selective, numbers will be controlled and the general level of stock will improve. It is noteworthy that wherever sound milk schemes have got under way the villager has been the first to realise that it is in his interest to go in for selective breeding and rid himself of the liability of supporting useless animals at the cost of his own..... A mass castration programme has been written into the third plan. It is vitally necessary that this is speedily implemented as Indian agriculture will never really get off the ground otherwise.

(From 'The Times of India' Editorial  
dated the 19th April, 1962)

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## GOSAMVARDHANA

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*VAISHAKH-JYESATH 1884 Saka*

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OUR COVER :— **The Harvesting Time**

# KAMADHENU

**K**AMADHENU—the giver of all that is asked for—has now stepped down to the extent that she is considered an object of pity, 'a poem of mercy' and the force of law has to be resorted to more than often to save her self and protect her progeny. How has this stage come into being?

Do we not have sentiments for the cow? Is there a radical change in our attitude of kindness towards her? Have we become unconscious of her importance in our socio-cultural heritage? Not that the answer to these questions would be in negative, rather, the sentimental attachment to the cow is now more vocal than ever it was and at the same time there is relatively a wider realisation of her basic importance in socio-economic structure.

Then, what is the knot that has created this complex riddle—the cow is in a seriously neglected stage to the extent that some-times she and her owner are said to be helpless and incompatible with the fast moving tempo of agro-economic pace of progress.

There is an illusion, obviously something fundamentally wrong in the approach towards the furtherance of the cause of the cow.

Sentiments, feelings and an attitude of regard or worship have their own contribution in creating an atmosphere and awareness about the position of the cow. At times these have conditioned the thought process of our masses to the extent of making them dogmatic and thus create a static and undynamic attitude which has impeded the rational and scientific development of cattle wealth. The provisions of law for cow protection may help in evolving a few external conditions in which the indiscriminate wastage or loss of useful cattle may be partially regulated.

How do all these make the cow and her progeny come out of her present dilemma? Their positive contribution towards strengthening the cow in real sense remains negligible.

Such a situation, therefore, calls upon focussing of the attention of all those interested in the real well being of the country—be the scientists, the animal husbandry experts, the legal defenders of the cow, those who respect the cow to the brink of worshipping her—should come together and make the cow self dependable, strong enough to stand at her own. A vigorous developmental programme has to be followed from the lowest level of Panchayats to the level of the formulation of national policy towards the cattle development of the country. Once, it is done, she would not need our mercy, or the slogans to protect her; or the law to come to her rescue. She would not invoke pity but command reverence and gratitude. She has to become real Kamadhenu—the giver of plenty. Then, will we need "external force" or mere negative conditions to protect the "giver of plenty"?

# Goals of the

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# MILK POLICY

*“.....A Welfare State, as a rule, must be concerned with not only increasing production of milk but also with its equitable distribution so that this valuable item of diet would come within the means of all income groups.....”*

★ **T**HE Directive Principles of State Policy as contained in Article 38 of the Constitution of India lay down that the State shall strive “to promote the welfare of the people by securing and protecting as effectively as it may, a social order in which justice—social, economic and political, shall inform all institutions of the national life.” One set of Directive Principles relates to social welfare which, among other things, calls for the raising of the level of nutrition and improvement in the standards of living and public health.

★ In a country where cereals dominate the diet of the people and where there is a serious deficiency of protective foods of high biological value, “raising of the level of nutrition”, undoubtedly implies that the State should take steps to increase the availability of protective

foods, particularly milk. At the same time, a welfare State, as a rule, must be concerned with not only increasing production of milk but also with its equitable distribution so that this valuable item of diet would come within the means of all income groups. Acceptance of this central ideology of a welfare State furnishes a base on which to build the structure of the milk industry. In the light of this philosophy the goals of the national milk policy should include :

- (i) *Improvement in milk production p animal.*
- (ii) *Quality Control.*
- (iii) *Meeting a minimum level of consumption.*
- (iv) *Expansion of consumption among lower income groups.*

By : MOSES DAS, M.A., M.Sc. (Ag)  
Allahabad Agricultural Institute

(v) *Improving efficiency in the assembly and distribution of milk.*

### **Improvement in Milk Production per Animal**

The major deterrent to milk production is the low yield per animal due to poor nutrition and a lack of knowledge at the farm level of good husbandry practices. Another factor responsible for this situation is the insufficient number of good dairy animals.

The need for improving the productive capacity of milch animals in India is imperative. It would reduce the cost of production and assure higher income for those engaged in dairy enterprise and, at the same time, larger volume of milk would be available for consumption.

The Planning Commission (Second Five Year Plan, p. 286) calls for the need for devising arrangements which will ensure prices which are remunerative to the milk producers. The question of remunerative prices to the producers is, in a great measure, tied up with the efficiency of milk production and the yields obtained per animal. Therefore, in schemes of dairy development, a high priority should be given to raising milk yields. There are evidences to show that the yields of many herds have increased through better feeding, selective breeding and efficient management, and these show the immense potentialities of milch animals in India.

### **Quality Control**

Improving the quality of market milk is another problem. Studies carried out in a few places in the country have shown that milk supplied both by urban producers and rural producers and distributors is highly adulterated in most cases and is of very poor bacteriological quality. According to an FAO Report (Report of the Meeting on Dairy Problems in Asia and the Far East Rome, 1959, p. 20) an important

factor limiting milk consumption is the lack of availability of good quality milk and milk products; the sale of poor quality and heavily adulterated milk leads to considerable prejudice on the part of the people with regard to milk consumption. The Report further says that the poor quality of milk is also associated with a lack of milk processing plants in many areas and with inadequate milk regulations and their enforcement. The contamination of milk with bacteria through utensils used in handling of milk at different stages, as well as through milking practices, is a serious problem; and the prevention of milk-borne diseases should obviously be an important point in all programmes of dairy development and organization of milk supplies.

### **Meeting a Minimum Level of Consumption**

When setting a national production target for milk one must take into account the increase in population in each succeeding period. An agreement has to be reached in regard to the minimum per capita requirements for a balanced diet, and this amount multiplied by the number of people will indicate the amount of milk needed. If the view of the Planning Commission is accepted that 15 ounces is the minimum requirement per capita per day for balanced nutrition, then this amount becomes the national target. The per capita consumption is estimated to be just 5 ounces. In order to achieve the minimum objective, production of milk needs to be nearly three times the present production.

### **Expansion of Consumption**

#### **Among Lower Income Groups**

The setting of a national target does not meet the goals of a welfare society. Assuming that the country can raise milk production so as to achieve the national target, the question arises if this would be a satisfactory situation. The existing consumption pattern and evidence available provide an answer in the negative. For instance, in a diet survey conducted in

Madras, it was found that 31 out of 44 families taken at random did not use milk in any form. (V. T. S. Mudaliar : A Handbook of Animal Husbandry and Dairying, Bangalore, 1956, p. 113). A national milk policy should aim at making milk available to the low income group population which forms the biggest segment of Indian people.

The same kind of situation exists in other parts of the country. A very large section of population with low incomes cannot afford to buy and consume milk. It is said that the greatest limiting factor in the consumption of milk is its high cost when compared to the low purchasing power of the low income groups. Therefore, an important question to answer is how far the schemes for development of the milk industry provide a solution to this problem.

The problem of uneven consumption of milk may be viewed from another angle. It has been asserted that the producers of milk in villages do not consume any reasonable amount of milk because of the lure of the getting supplementary income from the sale of milk. Thus, there is an imbalance between urban and rural areas in regard to the amount of milk consumption. The following statement by Satish G. Gupta (Cow in India. Vol. I, Calcutta, 1944, p. 1051), explains the point in question. "Milk is being drawn away to the city, leaving to the villagers yet less milk for home consumption. This is an unhealthy symptom. The bulk of the people of India live in the villages. The improvement of their health is primarily a question of the improvement of the health of the villagers. The hunger for money and the fascination for it are driving the villagers to send more and more of this life-giving article to the towns in the form of liquid milk and in the form of milk products, the chief amongst which is ghee."

Another authority on dairying in India (J. N. Warner, Dairying in India, Calcutta,

1951, pp. 7-8) comments : "Since a much smaller portion of all milk is consumed by those who produce it, that is largely rural people, than is consumed by those living in urban areas, the greatest potential market for milk is in the rural areas. It is essential, therefore, that our milk production be increased as rapidly as possible to meet not only the need in our cities, but the far greater need in our 700,000 villages."

#### **Improving Efficiency in the Assembly and Distribution of Milk**

The inadequacy of the marketing structure is one of the major deterrents to increased milk production in India. Milk being a highly perishable commodity, an efficient and suitable organization is needed to bring it rapidly and regularly to the consumers in a wholesome and fresh condition. In India facilities for rapid assembling and transport under suitable conditions are not yet developed, which make economic assembling of village milk difficult and unavoidably raises the consumer's prices and limits the availability of cheap fluid milk in sufficient quantities for consumption.

There is a wide disparity between the prices received by the producer and the prices paid by the consumer, and the prices at which milk can be made available to the consumers are normally beyond their means. Therefore, an efficient system of assembling and distribution needs to be developed which would provide an incentive to the producer to increase production and ensure the availability of milk in larger quantities and lower prices to the consumer.

The most important factor causing the very low per capita consumption of milk in India is its high cost when compared to income levels. The high cost of milk is related to the high cost of production and an inadequate and inefficient system of assembly and distribution. This is borne out by a comparison of price movements of milk in India and other countries.

(contd. on page 18)

# R A N G E

## I M P R O V E M E N T

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by : Dr. P.C. Raheja

T present in the country there is a paradoxical situation. The human and cattle population are rising fairly fast and the resources for sustaining them are fast dwindling. This mal-situation can only be rectified by coordinating the utilization of resources effectively. In the First and Second Five Year Plans the chief emphasis in the agriculture sector had been on the development of food resources and increasing the production of cash crops required for export or for manufacturing industries to produce consumer goods for the domestic and foreign markets. A few sporadic attempts had been made to improve forage and fodder resources in the country. The deficit of forages for the enormous livestock population is so large that sporadic disorganised attempts can only achieve but little results. Obviously a strong executive action can only bring about quick and practical results.

### Forage Resources

In the country forage resources can be divided into the following :—

(a) Production of fodder and forage crops in cultivated areas.

- (b) Grazing provided by common lands in the villages.
- (c) Grazing and forage production on crown or public lands.
- (d) Forage production and grazing in afforested areas.

Besides, the livestock graze on stubble after the harvesting of the crops from the cultivated areas. The forage provided by this grazing consists of remains of stubble and palatable weeds left over in the fields.

It is estimated that not more than 10 per cent of the requirements of forages is met with by fodder and forages produced in the cultivated lands. Usually this provides substantial requirement of work cattle during the working season for a period of 6-7 months. For rest of the period the animals remain underfed. The animals in the villages roam about on the common lands which normally form about 8-10 per cent of the gross area of the villages. Most of these are in the deteriorated state and the grasses are grazed off immediately they emerge from the stubble of the perennial grasses or



forage available there cannot be fully utilized. The subject of setting up fodder banks in these areas was discussed in a meeting of the Board of Agriculture and Animal Husbandry in India, Animal Husbandry Wing and setting up of experimental banks was suggested which as far as the author is aware, have not been set up with any conspicuous success. Besides, so far little attention has been paid to study the forage production of these areas, botanical composition of the flora, method of improvement and so on. In most of these areas unpalatable grasses, have become dominant due to lack of range management practices. Sometimes unregulated cutting of grass is permitted, which hampers the full stand of palatable species. Thus systematic exploitation of forage resources in afforested areas has not yet been attempted.

### Improvement of Forages

The evolving of high yielding forages has been in progress for the past seven decades. Initially temperate zone forage crops were introduced. Of these lucerne, berseem and oats have been adopted by the farmers in irrigated tracts. The improvement on non-irrigated forage crops has been taken up recently and several *Jowar*, *bajra*, *cowpeas*, *Dolico*, *lablab*, *ragi* and other forage crop varieties have been selected and introduced in various non-irrigated tracts of the country. In the initial stages several grasses were introduced on the Indian Military Dairy Farms and have spread to various parts of the country. These are Sudan, Napier, Giant star, Rhodes grass, and so on. The systematic work on selection of grasses and legumes for pasture was started in 1947 in the Division of Agronomy, India Agricultural Research Institute, New Delhi and a little earlier at the Government Agricultural College, Poona. The Indian Council of Agricultural Research have taken a very keen interest in pasture grasses and have financed several

schemes to conduct research on range management aspects and initiated All India scheme for Ecological Survey of Grasslands. These have provided very useful information for development of grasslands in the country.

As a practical step the Government of India through the Soil Conservation Board initiated a Demonstration Scheme for development of 550 paddocks of 200 acres each to demonstrate the value of deferred rotational grazing in Western Rajasthan. This was modified into Range Management and Soil Conservation Research Scheme. The treatment in this scheme consists of the following.

### Main Treatments

(a) *Soil Type* :

- S1 — Heavy
- S2 — Light

(b) *Rainfall Region* :

- R<sub>1</sub> — 4— 10'' rainfall region
- R<sub>2</sub> — 10— 20'' rainfall region

(c) *Condition class of grassland* :

- E — Excellent condition class—  
Ch Dry matter  
production/ann.
- G — Good condition class-do-
- F — Fair " " -do-
- P — Poor " " -do-

Total No. of treatments— $2 \times 2 \times 4 = 16$   
Area of each block=200 acres (Approx.)  
No. of replicates=Four.

### Sub-Compartment treatments :

- CI — Continuous grazing at a controlled rate.
- CII — Complete closure to grazing throughout the year. Reseeding and fertilization to be done in strips.
- CIII — Closure for 8 weeks from 1st July preceded and followed by continuous grazing at controlled rate.

CIV— Closure for 16 weeks from 1st July preceded and followed by continuous grazing at controlled rate.

CV — Closure for 8 weeks from 26th August preceded and followed by continuous grazing at controlled rate.

CVI— Closure for 16 weeks from 26th August preceded and followed by continuous grazing at controlled rate. Area of each compartment = 33 acres (Approx.).

This scheme of range management studies will ultimately have 64 blocks. So far only 39 blocks have been set up and the results from these blocks have provided very useful information on plant succession; vegetative cover; forage production; natural grass cover on rangelands of different condition classes, effect of seeding, soil working and fertilization on forage production; engineering works and livestock grazing studies.

On the basis of the data of past two seasons the following results are available.

1. In "EXCELLENT" class grasslands in spite of the low rainfall of about 10 inches (25.4 Cms) about 40 mature cattle could graze throughout the year in 200 acres.

In "GOOD" condition class the number of animals introduced in an area were 16 in 200-acre natural grassland.

The carrying capacity of "FAIR" and "POOR" areas were 10 and 7 animals respectively for 200 acre paddocks.

2. Soil working together with seeding of natural grassland, with mixture of *Cenchrus* species and *Lasiurus hirsutus* in sandy soils and *Cenchrus* species and *Dichanthium annulatum* in heavy soils are the best range management practices for rehabilitating the "POOR" and "FAIR" condition class natural grasslands.

3. In "GOOD" and "EXCELLENT" pastures responses to application of 20 lb. N and 20 lb.  $P_2O_5$  were quite promising.

4. Simple soil working in "FAIR" and "POOR" condition class grasslands destroys less edible and undesirable annuals such as *Aristida* sp. and gives rise to better species like *Digitaria marginata*, *Eleusine flagellifera* and so on thereby helping in the regeneration of the vegetation in the grassland areas.

5. In "EXCELLENT" and "GOOD" condition class grasslands it was essential to remove excess grass at the close of monsoon season for hay to maintain the grassland in the most productive state. The ungrazed material at the close of grazing season, just prior to monsoon must be harvested to regenerate fresh growth of the sward otherwise the grassland tends to deteriorate.

6. For deteriorated grasslands contour furrowing and seeding on flat lands hastens the establishment of seedlings from sown seed and regeneration from the seed in the soil. A fair cover of annuals and perennials is obtained within a year to carry one adult animal per 10 acres of the fenced grassland, grazed on a deferred-rotational system.

7. *Zizyphus nummularia* (Ber) leaves contain about 14.5 per cent protein. The optimum density of this shrub is 14 per cent in the grasslands. This density provides 125 Kgm of high quality top feed along with 875 Kgm of grass per hectare during the scarcity period when protein in grasses is very low.

8. On the basis of per unit length cost and least depreciation angle iron-barbed wire fencing is the cheapest means of fencing grassland areas. The second best is the stone posts and barbed wire fencing. In the absence of these materials ditch fencing together with thorn fencing may be adopted.

Recently the Govt. of India have decided to set up a Grassland Research Institute in the Third Five Year plan to conduct researches in Ecology, Agronomy, Genetics and Plant Breeding, and Pests and disease control. This together with research centres in the states should provide quickly research information for development of grasslands in the country.

#### **Associated Agencies for Forage Resources' Development.**

Development of forage resources falls within the preview of Agriculture and Animal Husbandry Departments. In most states the Departments of Agriculture conduct researches on forage and introduce improved forage production practices on cultivated areas and in the rangelands of the various tracts.

During the Second Five Year Plan the improvement of forage production has been adopted as a programme of the Key Village Scheme and Key Village Officers have taken up the responsibility of increased forage production in the Key Village blocks. Fodder Development officers have been appointed to coordinate such developmental activities. The Central Council of *Gosamvardhana* is indirectly associated with these activities and increasingly takes an active interest in this subject.

In the Third Five Year Plan in the Dairy Development Schemes and the schemes of mixed farming financial provisions have been for augmenting the production of forages, particularly legume forages, to enlarge dairying and introduce balanced farming in various stages.

Most of these agencies will be carrying out activities in more favourable situations. But by far the largest proportion of forage production takes place on public lands and in common village grasslands which at present receive little attention of any of the agencies. In the United States of America the Range Management Division is located in the Department of Soil

Conservation and operates under the Soil Conservation Law which contains provisions of administration and regulation of pasture-lands and their development.

In India on the Public lands the grazing is mostly carried out by nomadic graziers. They require special control which at present cannot be exercised as there is no unified agency to exercise control on them. There is no unified law to control grazing on public lands and forest areas and undertake their development in a regulated manner. Such a law, in a democratic country like India, must have the force of public opinion at the back of it.

#### **Problem Areas and Agencies suited to tackle their problems.**

The gross area of India is about 1.22 million square miles. Of this about 325,000,000 acres are cropped every year and about 75 million acres remain fallow. Thus area covered by cultivation is 0.625 million square miles or about 50 per cent of the total area of India. Of the remaining area about 23 per cent is forests and another 15 per cent are rangelands in the plains, valleys and hills. Assuming that 12% of the forest area is accessible for forage development, the total of about 27-30% provides uncontrolled and unregulated grazing and there is no unified law to control production and distribution in this area. The problem area is sufficiently large to demand unified attention for its development.

This area is mostly marginal land which cannot be brought under cultivation and full scale forest development due to uneven terrain, eroded nature of land, lack of water conservation measures, low level of soil fertility, shallow depth of soil, low density of population, high cost of development and lack of communications. Here grass cover, together with regulated grazing, can support a large population of lives-

took provided it be developed on sound lines. In Western Rajasthan where rainfall is erratic, fertility of land is low and grass cover is poor, the adaption of range management practices has enabled rapid development of forage resources. Same techniques applied in other marginal areas can enhance forage production quickly for the betterment of livestock industry. These techniques essentially are of the nature of soil conservation and the Soil Conservation Departments in the states can tackle them.

In this connection it would be worth while recording the observations of Mr. Donald A. William, Chief, Soil Conservation Department, who visited India recently and stated, "The research and demonstration work on grass in the arid zone clearly shows that such lands can be vastly improved in productivity and the soils stabilized from wind erosion. However, such improvement necessitates the boldest administrative action in the restriction of grazing use until recovery occurs and the management of grazing use, thereafter consistent with desired vegetative types and their sustained vitality. Technical experts can do little in this area to apply their knowledge until necessary administrative action are taken."

The common lands in the village have again to be rehabilitated by democratic means. In most of the villages *Panchayat Samities* have been set up. These return representatives to the *Zila Parishads*. The *Panchayat Samities* are taking up by and by the responsibility of agricultural and animal husbandry development in their villages on the basis of Block programme. For the development of problem lands it is essential that Block *Samities* and *Zila Parishads* should have sub-committees on Soil Conservation which should draw up programmes of their development on a regulated basis. The *Zila Parishads* should have representatives on the State Soil Conservation Boards to present their plans to the State Government.

As already stated the forage production programmes in the Key village Blocks and in other cultivated areas are being organised by the Departments of Agriculture and Animal Husbandry in the States. These may be conti-

nued to be administered as at present. Here the Central Council of *Gosamvardhana* can play a significant role in development activities and I.C.A.R. in organisation of research programmes in the States.

The development of rangelands involves engineering works for conservation of soil and waters; adoption of range management practices; improvement of fertility of land; increase water holding capacity; introduce productive pasture grasses; take up soil working, seeding and fertilization practices; and interrelate pasture production to forest establishment. Thus pasture development is an integrated programme, and can largely be undertaken by the Soil Conservation Departments which have Divisions of Engineering, Agronomy, Range Management, and Forestry. At present the State Departments of Conservation do not have such units. Their establishment is an essential pre-requisite to increasing forage production from problem areas and on common village lands.

### General Conclusions

From the above analysis of the situation it is obvious that greater part of the forage production for the livestock comes from marginal lands and common lands in the villages. Substantial increase in production can be brought about on these lands by coordinated development through an organised agency. The agency most suitable for undertaking this task are the State Departments of Soil conservation which have the units of Soil Survey, Agronomy, Range Management, Soil Conservation Engineering and Forestry. For regulated development Soil Conservation law should be enacted in every state which should be administered by the state Soil Conservation Department. In the development planning panels at the centre and states there should be representatives of the Soil Conservation; Central Council of *Gosamvardhana*; I.C.A.R.; Agriculture, Animal Husbandry and Forestry Departments, so that interests of research on grasses and legumes, fodder trees, water shed management, livestock and so on are looked after properly. Without the provisions of regulated grazing in the soil conservation law it would be impossible to rehabilitate marginal and common lands and augment forage production in the country.

By : **SHRI S. BASU**

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Husbandry and Dairying,  
B. R. College, Agra.*

A routine examination of the reproductive organs of all non-pregnant cows every month will increase the breeding efficiency of the herd

## **B** REEDING difficulties

in

dairy

## **C** ATTLE

A cow should calve every year. Longer the period between two successive calvings, greater is the loss to the owner. Freshly calved cow should be made to conceive as early as possible after a rest of 60 days. Oestrous cycle is suspended during pregnancy. It recurs after calving. In exotic breeds it appears within 100 days of calving (Edwards, 1951). In our country, recurrence of oestrous cycle after calving is delayed by over 6 months. Kohli and Suri (1960) report this period in Haryana breed to be 230 days. It makes cow-keeping a serious problem. Consequently attempts should be made to remove the various degrees of infertility that are responsible for the prolongation of the postpartum oestrus interval.

The absence of heat is the major difficulty that is met within our dairy cattle. In rare cases the failure of the oestrus to reappear after calving is due to the inability of the corpus luteum of pregnancy to regress completely. A more

frequent case is an animal, which after receiving a service, fails to conceive but may be bearing a corpus luteum in her ovary. This is often confused with pregnancy. However, a second examination of the cow for pregnancy at a later date will remove the confusion. Whenever the corpus luteum is responsible for holding up the oestrous cycle, the enucleation of it followed by massage of the uterus and ovaries through the wall of rectum will bring most of the cows to heat.

Heat symptoms may also be absent due to completely inactive (anoestrous) ovaries, in which case they are smaller in size and produce neither follicles nor corpus luteum. There is a suggestion that such a condition may be caused by a low plane of nutrition. Improved nutrition prior to breeding may control the disorder. But if it exists in few normally fed heifers or cows, follicle stimulating hormone (PMS 1000 i.u.) may be injected subcutaneously when the oestrus will be expected to appear on the second or third day after injection (Bhattacharya et al., 1941). PMS should not be injected when a corpus luteum is present as ovarian cysts may form.

In certain cows the heat period recurs at irregular intervals of fewer than 15 days or they may be in continuous heat without conceiving. It is due to the formation of a cyst in the ovary. This condition may be corrected either by rupturing the cyst or by injecting luteinising hormone (10,000 I.U. of chorionic gonadotrophin s.c. or sheep pituitaries I.V.).

A routine examination of the reproductive organs of all non-pregnant animals every month will increase the breeding efficiency of the herd.

The appearance of any unnatural discharge in animals with breeding troubles indicates the presence of certain disease factor. It may be pyometra, various forms of metritis, brucellosis,

trichomoniasis, or a mummified foetus. The disease should be diagnosed and treated. Nodular vaginitis or vulvitis is a common complaint for impairing the fertility of our heifers and cows. The cause is not clearly known. The washing of the uterus regularly for sometime with antiseptic solutions (e.g., 1% lugol's soln.) may bring half of the cows to heat.

Mineral deficiency has often been associated with delayed first heat after calving. Eckles et al. (1935) investigated the state of fertility in a number of farms where there was a phosphorus deficiency. He found a condition which was very similar to that of ours at present. One calf was obtained from a cow every two years. Heifers often failed to come in heat until they were past two years old (average being 7 to 10 months in their country). Cows tended to have subactive ovaries. Cows after one or two heat periods became anoestrus for the remainder of their lactation and heat periods were resumed after they had been dried off. Palmer et al. (1941) found delayed first heats and later, ovulations without heats at normal intervals in heifers raised on phosphorus deficient diets. Similar may be the situation with us in this regard, as such the breeder may well be advised to send a sample of his concentrate and fodder to a nearby laboratory or an institution with requisite facilities for analytic work for a check up. The amount of phosphorus needed by a full grown animal for efficient reproduction is about 10 to 12 gms. per day.

There is another chapter of this story which is related with managerial practices.

Failure to detect signs of heat, though often promptly denied, is a major drawback in conceiving cows in time. Large herds should have vasectomized bull which should be sent along with the cows to grazing. Heat must be watched twice a day, in the morning and afternoon. The cows may, in some cases, come to heat after

dusk with the heat period ending before dawn. Presence of a corpus luteum found during regular examination of the animal indicates such an undetected case of oestrus. A herd down with breeding troubles, should be provided with a nightwatch.

The inability to breed at the most optimum time is another cause of delayed calving. The time for service or insemination is about or after the middle of heat. But as it is difficult to pin down the starting of heat period, Trimberger (1948) has suggested that for good results cows first observed in heat in the morning must be bred the same day and those first observed in the afternoon should be bred the next forenoon. This would mean breeding towards the end of heat period. The semen must be deposited in the mid-cervix.

Negligence in keeping the breeding records for the bulls, so as to recognise the poor breeders, is an important management fault.

Failure to change a bull whenever a cow does not conceive to two successive services may deteriorate the situation further.

The inheritance of infertility in cows is of doubtful significance. It has not yet been established that the parents contribute towards the infertility of its progeny. The heritability studies of breeding efficiency have not given consistent results. Studies by Dunbar and Henderson (1953), Legates (1954) and

Pou et al. (1953) reported heritability of conception rate near zero, whereas Wilcox et al. (1954) reported a heritability of 32% for calving interval and Inskip et al. (1961) found the heritability of conception rate as 8.5%. Spielman and Jones (1939) reported a high degree of inheritance of breeding efficiency in some cow families, while Tabler et al. (1951) reported negative. Trimberger and Davies (1945) and Mares et al. (1961) reported that conception rate in cows was affected significantly by the sire line. The information so far available, indicates that the sire affects fertility more than the dams. Moreover certain conditions, like, testicular hypoplasia, intersexuality, abnormal spermatozoa, some embryonic deaths, abortions and mummified fetuses, etc. result due to the actions of autosomal recessive genes (Eriksson, 1943; Hancock, 1953. Yapp, 1947 Mead et al. 1946). Examination of semen and complete breeding records of animals will help in detecting bulls having deleterious genes.

Mating between related animals should be avoided as it may lower the breeding efficiency. Woodard and Graves (1946) and Mares et al. (1961) reported a tendency for services per conception to increase as inbreeding was increased. Inbreeding is also responsible for the increase in embryonic deaths.

In all cases of breeding troubles, farmers are advised to consult a skilled veterinarian, the sooner the better.

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# Care and Management of the COW

*By : Y. M. Parnerkar*

IT is a well known fact that the efficiency of the animal depends upon firstly on its inherent capacity—as the power of a particular machine would depend upon its original capacity; and how carefully and skillfully the machine is put to use. In addition to feeding, the care and attention with which the numerous other details of management are carried out have a larger share in the final results obtained. The astonishing milk records of the cow and the draught capacity of the bullock are due not only to any sudden increase in the capacity of the cow but mostly to better methods of breeding and handling.

The cow is a creature of habits and the cowkeeper knows that regularity in feeding, milking and other items of handling depends upon the habits which are created in the animals. A cow used to milking or feeding

at a particular hour will not pay the same dividend in the hands of another cow-keeper who is not conversant with these practices. To get the maximum benefits from a high grade cow it is, therefore, necessary for her to be in the hands of a skilled worker equipped with necessary facilities for her well being. This is more true of a country like India, where animals are found in different stages of development and where the skill of the cattle keeper varies from place to place. The lack of proper facilities are practically noticed everywhere.

One of the most important factors that constitute better management is the shelter that is provided to the cow. The 'housing' problem naturally depends upon the climatic conditions of a particular region. In places free from heavy rains or extreme temperatures, no elaborate housing system is required but in



places where the animal has to undergo rigours of climate, adequate shelter has to be provided for. The simplicity and economics of construction are the main points which should be borne in mind at the time of constructing cow sheds etc. The convenience of the owner as well as the attendant has also to be looked after. It is possible to pay adequate attention to the problem of 'housing' when the number of animals is conveniently smaller and they are of superior quality, but in places where the animals are maintained only for the dung they give or occasionally they produce some bullocks, it would not be economical to have elaborate housing system.

There is a section of people who think in terms of keeping all the animals of the village in one or two convenient places according to the size of the herds. Others feel that the best management of the animal is ensured under the eye of the master and the owners should have their cattle sheds as near to their residences as possible. The Panchayats of individual villages should take up any of these practices according to the circumstances that prevail. Generally it could be recommended that the management and feeding of the animal should be the individual's job while the services may be common-cooperative or collective.

For the individual it would be advisable to divide the herd into various groups according to the use of the animal, viz: cows in milk, dry cows, sucklings, growing animal-males and females separately, breeding bulls and work animals, as the management practices differ according to groups shown above. Feeding also is different. Kindness to animals and regularity pays.

Water plays a very important role in cattle husbandry, but it can also do a great harm if it is not pure or is polluted. Care should be taken to provide clean water only. Water from

open tanks or rivers may bring about many disasters.

An abundance of fresh air is as necessary for the health of the cow as for any other animal and this should be provided without fail. Excessively warm weather is more harmful to the cow, than even cold.

The following rough schedule of management of the animal may be useful :—

The cow in advance pregnancy, say after 5-6 months pregnancy, needs special attention and as the pregnancy advances, more and more care has to be given. It would be advantageous to separate the cow from the main herd, say in the later part of the 8th month's pregnancy. The animal may be fed regularly and allowed sufficient water. The feeding would be of a nature which would keep the bowels free from any constipation. Trouble from dogs or any other sort of excitement has to be scrupulously avoided. The parturition should be natural and it should be interfered with only in case of necessity, but under good managerial conditions. Usually nature takes its own care. As soon as the calf is born it is allowed sufficient quantity of colostrum for a good start in life. The animals both cow and the calf are cleaned and kept under the sanitary conditions. The udder of the cow is emptied. In places where weaning at birth is practiced, the calf is taken away and fed artificially. Feeding of the colostrum is a must. The cow is to be adequately fed and the milking has to be complete, and at regular short intervals. As the calf grows, feed is regulated. From colostrum it is taken to whole milk, then skim milk and some sort of gruel is gradually introduced in the feeding. Concentrates are also introduced in in the feeding. By the 5-6 months the calf will take care of itself once the calf attains an age of nearly 9 months it will not need so much attention. In case of the male calf it would be a good practice if the animal is cast-

**In addition to feeding, the care and attention with which the numerous other details of management are carried out have a larger share in the final results obtained.**

rated, say at the age of one year to  $1\frac{1}{2}$  years. Only these male calves that are intended for breeding purposes should be kept entire. The female calves under good care would attain maturity in the normal course at the age of 2 years and  $2\frac{1}{2}$  years. She should be mated to a high class bull to ensure better progeny. She will drop her first calf by three years and then can be treated as a regular cow. The male calves not intended for breeding are castrated and allowed sufficient attention and feeding for their maximum growth as bullocks. They are used for light work from the age of  $2\frac{1}{2}$  years onwards and gradually the quantum of work is increased. The breeding bull has to be very carefully reared and special care has to be taken so that it does not become ferocious or forms bad habits. A bull can be used, say at the age of 2 years onwards. The efficiency of the working bullock can be greatly increased by providing better implements.

The cow needs sufficient exercises in order to maintain herself healthy. This would be ensured by letting the animal out for grazing and allowing her to go out at regular periods but too much of walking for grazing purposes tires out the cow and a good percentage of energy is wasted in going from place to place. When the animal has not to go on long distances or cannot go out, groaning will take its place.

In large herds it would be a good practice to mark the animals for individual recognition. It can either be done by tattooing, branding or tagging. Some people prefer to dehorn the cattle to avoid any casualty in the herd, injuring other animals. But this practice has not yet found favour with most of the breeders.

In order to maintain the animals healthy it would be advisable to take scrupulous care to maintain the surroundings in good condition. Flies and other parasites effect the milk yield as well as other performances of the cow.

Even after necessary pre-cautions are taken, the animal do very often suffer from some ailment or the other; and if timely care is not taken, the ailment shall rapidly develop into serious illness and many times great losses do occur. It is, therefore, very necessary for the owner to watch the animal and take effective steps to control any ailments creeping in the very beginning. The owner has to acquire sufficient knowledge of keeping his livestock healthy and take up elementary treatment in times of need. He need not try to be an expert veterinarian. The village Panchayat should make it a point to keep necessary equipment and medicines for at least first aid treatment or locate it with some body interested in the job. The Government maintains

a reliable veterinary service throughout the country. We have a good net-work, and should make full use of this facility provided by the Government. But this should not mean that the owner should rush to the veterinary doctor for any sort of thing or wait till the malady develops quite seriously. Good contacts with local veterinary doctors will greatly help.

But there are many diseases, especially epidemics which are beyond the control of any individual. This is a responsibility of the Society as a whole and as such has to be tackled on community basis. The cattle owner should have working knowledge of the steps which he has to take when any epidemic spreads out in the locality. The Panchayat should always keep a careful watch in the surrounding areas and if reports are received from nearby villages, adequate steps should be taken to ward off the disease. Strict quarantine will be of good help. In the country there do

occur a number of epidemics and the loss due to these is very high. Experts have now brought out some very useful vaccines etc. and if timely precaution is taken, many herds can be saved. With all the precautions if any case occurs in the village, the affected or other animals coming in their contact should be immediately segregated and the nearest veterinary authority should immediately be informed. On a visit from the local authority he should be given all information that he needs and his instructions should be strictly followed. Great care should be taken to dispose off the dead animals suffering from the disease.

It would be a good practice if the village panchayat could get as many of the stock owners as possible trained in the art of keeping live stock healthy and treat them whenever they get sick. The control of epidemics should be conveniently left in the hands of skilled veterinarian and timely help given to them for this important social activity.

*Contd. from page 6*

**Retail Prices of Milk in some Selected Countries during 1938 and 1947**

Country	Price in Annas per lb. (1938)	Price in Annas per lb. (1947)	1947 price as percentage of the 1938 price
United Kingdom	2.50	3.20	129
Ireland	2.00	2.40	120
Sweden	1.25	1.70	134
Denmark	1.55	2.35	131
U.S.A.	2.90	3.45	119
Canada	1.95	2.65	137
New Zealand	1.80	2.05	110
Indian Union			
(a) Raw Milk	1.20	5.00	414
(b) Pasteurised Milk	2.50	6.00	240

(Source: FAO, Bulletin on Dairy Products, February 1950)

From the above Table we note that in 1938 the price of raw milk at retail was the lowest in India, but in 1947 it was the highest. The average rise in the prices of milk in other countries of the world during the period was about 26 per cent whereas India had a phenomenal rise of about 315 per cent. Although comparative figures of family incomes and standards of living in different countries are not available,

the average per capita income in India is relatively small compared with many other countries. The following statement by Mudaliar points to the unorganized system of milk collection and distribution as responsible for the high cost of the product to consumers. He says: "The retail price of milk is high in other countries when compared to the price paid to the producers chiefly because of the high cost of pasteurizing, bottling and distribution. The cost of such services was 40 per cent of the retail prices in England during 1939. In India, milk is collected from the villages and retailed in towns, without pasteurization or any processing. The part of the price paid by the consumer appropriated by the distributing agency is about 37 per cent, or nearly as great a fraction as the cost of pasteurization, processing and distribution in England."

The FAO Report on the Meeting on Dairy Problems in Asia and the Far East emphasized that the lack of proper marketing structure has caused (a) the sale of adulterated milk, (b) the sale of unhygienic milk, and (c) the development of antipathy toward milk consumption.

Therefore, a national milk policy in India should aim at improving the system of assembling and distribution with a view to reconciling two objectives, viz., the protection or stabilization of producers' incomes and the provision of dairy produce to consumers at the lowest possible price, under clean and hygienic conditions.

# Sterility And Delayed Breeding In Dairy Cattle

By :

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OF the many causes that render the dairy cow uneconomical anywhere in the world, sterility and delayed breeding are the two important ones. The gravity of the problem may be judged by the fact, that sometime back in New York State, (U.S.A.) alone, the losses due to this trouble were in the vicinity of 20 million dollars per year. In England, even today, 3% of breeding female are culled every year because of delayed breeding, 10% of the herds suffer from some degree of in-efficient breeding, but a few herds have breeding troubles spread over a period of a year and sometimes years. Similar data about Indian cows, is not available but according to a rough estimate the number of unserviceable cattle is 2%, while that of unproductive is 8%. According to the Report of the Cattle Preservation and Development Committee (1949), the number of unserviceable and unproductive cattle was about 28 lakh, and 1 crore 12 Lakhs respectively.

Sterility is not a disease by itself, but it is a condition of non-fertility, wherein the animal does not breed. Sterility may be complete or partial. The problem, therefore, covers a long range of condition varying from slightly delayed

breeding to complete sterility; and is exhibited through the following symptoms :—

- (i) Delayed maturity.
- (ii) Long calving interval in females or low frequency of semen donation in males.
- (iii) Not breeding throughout life.

## Symptoms

### *Delayed Maturity :—*

In most of the Indian breeds of cows and buffaloes, the heifer or a bull calf normally matures at the age of about 3 years; whereas in foreign breeds of cattle maturity is attained at half the age, i.e., 1½ years. In England the N.M.R. herds have an intercalving period of only 13 months. This delayed maturity in the common Indian cattle amounts to almost double the expenditure on their maintenance while the useful period of life is reduced appreciably, because the frequency of calving is minimised and the number of lactations will be reduced.

### *Long calving interval in females or poor semen donation in males :—*

According to Dr. P. Mahadevan the intercalving period of 11 leading herds of six dif-

ferent breeds of Zebu Cattle averaged 451 days from the year 1938 to 1949, and 408 days from the year 1950-53; but the number of such herds is very few when compared with the total cattle population of the country. Although no statistics is available to indicate the average inter-calving period for common cattle, yet it may roughly be taken as two years; whereas it should not be more than 15 months in any case. Depending upon the extent of sterility, the duration may prolong further to any degree. In case of males the frequency of semen donation or quantity is reduced or quality deteriorated.

#### *Not breeding throughout life :—*

Some animals do not breed, either because of apparent or internal defects. The animal may either look normal or abnormal but it does not breed throughout life. The reason may be any one or more of those described herein later.

#### *Physiology of reproduction :—*

The reproductive organs are simple to visualise but the way these function (physiology of reproduction) is fairly complicated, specially because, the symptoms of heat in females are not so very clear as to be sure about the heat period, in all cases. The heat period is short, i.e., 18-24 hours. The stage of shedding egg, i.e., about 14 hours after the onset of heat, is hard to estimate. The period between the different heats (21 days) is a bit longer in view of the reproductive cycle of the cow. The level of hormones at which the reproductive organs of cow work is very low. In view of these peculiarities the physiological conditions of each animal are to be studied with care for enhancing their reproductive efficiency.

In case of the bull, the male organs along with its accessories look simple in appearance, and the act of ejaculation appears to be a normal procedure, but the physiology of male organs

though slightly different from females yet is equally complicated in its function, as its actual operation is the result of a chain reaction, i.e., when a cow in heat is brought close to the bull which gets a thinking of being with the cow whereby his pituitary is stimulated. This stimulates the sensory nerves which in turn stimulate the male organs. In case the conditions, at this stage, continue to maintain the bull in reaction, it jumps over the cow or dummy and ejaculates into the natural or artificial vagina as the case may be. Since the interval functioning of all the parts of male generative organs is not visible, this process of male appears simple; but it is fairly complicated in its physiology. There is, however, no question of reproductive cycle in the case of males and the reaction of bull mainly depends upon its plane of health, the frequency of its use for breeding and the inherited sex desire (*libido*).

Sterility of any kind, partial or complete hits hard at the economic aspect of the cattle. The extent of its deleterious effect depends upon the extent of sterility in individual animal. On the whole, sterility is one of the most important factors, besides other three factors, i.e., genetical, nutritional and diseases control which are responsible for economic losses in cattle. Since sterility commonly relates to mature animals at their economic age it is highly important to control sterility to reduce losses. Sterility is of different types and differs in individual cases and as such its treatment would differ on the merits of the individual case. Hence before taking up any remedial measures, the preliminary step would be to diagnose as to the type and cause of sterility.

Sterility may be of two types, i.e., (a) Hereditary (b) Acquired.

The causes of infertility are many which can be classified into the following two main categories :—

I. Non-pathological.

## II. Pathological.

### Non-pathological :—

This is further sub-divided into four types; i.e., (a) Structural, (b) Physiological (c) Nutritional and (d) Managerial.

#### (a) *Structural* :—

The structural defects may be either congenital or acquired. In the case of a male some of the deformities are like the incomplete union of testicles with the ducts through which sperms pass, or it may be the mal-formation of the penis. The other common abnormality is undescended testicles in which case the spermatozoa are not produced because of higher body temperature which is not suitable for spermatogenesis as is in the case of scrotum which hangs outside the body (usually at a temperature lower than the body temperature). In the case of only one testicle hanging while the other being held up in the body, sperm formation takes place and the bull may fertilize the cow but such a bull should not be used because this defect is hereditary and therefore, be transmitted to the progeny. The acquired defects develop for reasons of certain injuries to the body such as injuries to the hind legs or occurrence of hernia; or certain injuries to the male organs.

In the case of females structural abnormality due to the natural causes may be in the form of animal being freemartin or hermaphrodite or the persistence of hymen (Septum) or incomplete oviduct etc. The acquired defects may be like the twisting of ovary, curvature of cervix, dilatation of Ovary, ballooned vagina, development of tumours or cyst recto-vaginal fistula and some other defects due to accidents and injuries etc.

#### (b) *Physiological* :—

The physiological function of the reproductive organs depends upon the co-ordination and equilibrium of the various hormones of the body. The imbalance of hormones results into one breeding trouble or the other. The common

breeding troubles in the case of females are nymphomania or hyper sex desire, persistent corpus luteum resulting into the cessation of oestrus cycle or anoestrus, and irregularity of oestrus cycle. Other defects are silent oestrus, perpetual oestrus, split oestrus, weak oestrus, short oestrus and anovulatory oestrus etc. Even in England it has been found that physiological infertility is the main source of losses. About 20% of the conception rate falls due to foetal losses in early stages.

#### (c) *Managerial* :—

In scientifically advanced countries, the managerial practices have been so well standardised that sterility in cattle on that account is negligible. In India cattle keeping is under diversified conditions and majority of the cattle remain uncared for. The cattle keeper is ignorant of suitable breeding practices and the knowledge of reproductive physiology is unknown to him. His feeding resources are meagre and there are no well established markets for the disposal of his surplus cattle, milk and milk products. Under these circumstances the cattle keeping is a side industry to agriculture and no care, what-so-ever, is taken for the proper management of the cattle, as a result of which some cattle become sterile.

#### (d) *Nutritional* :—

Mal-nutrition is probably the greatest single factor responsible for sterility in dairy cattle of this country. In advanced countries standard and well balanced rations are fed and the only deficiency at times detected is that of vitamins and minerals; while in India a large number of cattle are hardly fed with their full requirements of roughages and concentrates and even the theory of balanced ration is known to a few cattle owners. Thus the nutritional deficiencies result into poor development of sex organs, their retarded activity and hormonal imbalance which reduces sex desire (*sex libido*). In males, poor nutritional level causes the testicular atrophy which retards spermatogenesis

and forms semen of poor quality. In females the poorly developed organs are slow in their function, exhibit poor symptoms of heat and are hard to conceive. Some of the animals after conception do not develop the foetus properly and abort while others drop weak calves. Thus nutritional deficiency results into innumerable breeding troubles and is an important cause of sterility in dairy cattle.

## II. Pathological :—

The pathological condition of the reproductive organs caused under the influence of a variety of sources, is a very important factor of sterility in dairy cattle. The pathological condition may be due to either (a) some specific diseases or (b) non-specific causes. Amongst the specific diseases, the following are most important :

### (A) *Specific diseases* :—

1. Brucellosis (Bang's disease).
2. Tuberculosis.
3. Trichomoniasis.
4. Vibrio fetus.
5. Vaginitis.

### (B) *Non-Specific diseases* :—

A number of organisms other than these described above are responsible to disturb reproduction in the case of cattle. *B. Coli*, *B. Pyogenes*, *Staphylococci* and *Streptococci* are some of the common organisms responsible for causing the cattle sterile.

## Suggestion to reduce the incidence of sterility and delayed breeding in dairy cattle.

Although every solution of the problems of sterility lies within the four words breeding, feeding, management and disease control, yet it would be necessary to describe the various essentials, as follows :—

### A. *General* :—

1. The cattle-keeper himself should know the art of cattle breeding.
2. He should be cattle minded and should develop love for the cattle.

3. While selecting cattle for purchase, animals from naturally fertile strains should be selected.

4. Although feeding of balanced ration is important at all stages of life to maintain proper breeding efficiency, yet special care should be taken to supply balanced ration including plenty of greens to mature males and females in order to produce viable and healthy germ cells. In mature females under feeding results in hypo-function of ovaries; while in males it results into a lack of sex desire.

5. Good health in the base of efficient breeding and production; hence every care should be taken to keep the herd healthy right from its birth till old age, and specially after the cattle has attained breeding age.

6. Do not neglect the routine checks of bulls and cows.

7. The cattle should be provided with all essential comforts like suitable sheds to protect from inclemency of weather and exercise preferably on grazing grounds, and plenty of clean water and sun light.

8. Although kind treatment to animals apparently does not have a direct bearing on the breeding efficiency, but some animals are temperamentally very sensitive and need specially a kind attitude when in heat; and slight rough treatment makes the animals to behave abnormal when it is hard to detect heat. Even if the heat is detected it would not come close to the bull; and would miss the service, thus, reducing its breeding efficiency.

9. Breeding records should be maintained correctly and completely.

10. In most of the cases sterility is because of the infections of vagina, cervix and uterous which can be corrected by therapeutic and hygienic measures.

### B : *Specific* :—

1. A complete and proper record should be maintained of all the cattle to rightly judge the age of maturity of each heifer or bull calf. ●

2. Depending upon the breed, the animal should conform to proper health, size and weight.

3. Any deficiency under No. 2 should be made up and the animal should be allowed to breed in normal course.

4. The bull to breed or the bull from which semen is taken for insemination should be free of genital diseases.

5. Signs of heat should be detected and the animal should be bred in later half part of the heat period.

6. Cows that show un-natural discharge should not be bred.

7. In case of the heifer which does not come in heat at proper age, she should be examined per rectum to see abnormality, if any, with her genital organs and then to treat her accordingly.

8. After breeding, feed the animal with less heat producing feeds and provide plenty of clean water to drink.

9. Observe recurrence of heat after 20-21 days.

10. If the animal comes in heat again she should be bred with more care this time after examining her genital organs.

11. Perform pregnancy diagnosis test after two months.

12. If the animal is not pregnant, it should be reexamined per rectum for the normalcy of the genital organs. If every thing appears

normal, may be that animal has passed foetus unnoticed. Then it could probably be Trichomoniasis or some other disease. So, the treatment should be taken up accordingly.

13. On ascertaining the pregnancy, the animal should be given some increased ration.

14. Special care then should be taken for accidental abortions or infections.

15. Even with all care, if the animal aborts within 5th to 7th month of pregnancy it is more likely due to Brucellosis for which tests should be performed. The animal should be segregated from other animals.

1. If the cow shows signs of difficult parturition, it should be helped physically.

17. In cases of abnormal parturition, like prolapse of vagina etc., the animal should be properly treated by setting the organs in proper place, douching the same, and later on seeing the animal catch no infection.

18. After calving, if a cow has not cleaned properly, do not breed such a cow till she is free of the discharge and has been properly tested.

19. The treatment of sterility should be taken up after thorough examination of the genital organs, performance of necessary tests, studying the history and records of the animal.

20. Remember that, no one, treatment is cure all for all types of sterility, but a specified treatment will be required for every specific cases.

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# Ninth All-India Livestock Census 1961

## Abstract/Statement of Cattle

### MAHARASHTRA

S.No.	Item	1961 Census (Numbers)	1956 Census (Numbers)	Percentage of increase.(+),or decrease (-) of Col. 3 over Col. 4
(1)	(2)	(3)	(4)	(5)
<b>1. CATTLE</b>				
(a) Males over 3 years				
	(i) <i>Used for breeding only</i>	26,229	48,919]	(-) 46.4
	(ii) <i>Used for breeding &amp; work both</i>	289,186	—	—
	(iii) <i>Used for work only</i>	6,088,318	5,629,300	(+ ) 8.2
	(iv) <i>Others</i>	114,512	140,447	(-) 18.5
	<i>Total</i>	6,518,245	4,818,666	(+ ) 35.3
(b) Females over 3 years.				
	(i) <i>Breeding</i>			
	(a) <i>In milk</i>	1,639,820	1,760,697	(-) 6.9
	(d) <i>Dry &amp; not calved even once</i>	2,949,954	2,515,631	(+ ) 17.3
	(ii) <i>Working</i>	64,246	17,325	(+ ) 270.8
	(iii) <i>Others</i>	23,425	25,165	(+ ) 6.9
	<i>Total</i>	4,677,445	4,218,818	(+ ) 10.9
	(c) <i>Young Stock</i>	4,330,500	3,950,503	(+ ) 9.6
	<i>Total Cattle</i>	15,526,190	14,087,987	(+ ) 10.2
<b>2. BUFFALOES</b>				
(a) Males over 3 years				
	(i) <i>Used for breeding only</i>	18,193	18,918	(-) 3.8
	(ii) <i>Used for breeding &amp; work both</i>	33,895	—	
	(iii) <i>Used for work only</i>	301,320	267,672	(+ ) 12.5
	(iv) <i>Others</i>	7,471	9,188	(-) 18.7
	<i>Total</i>	360,879	295,778	(+ ) 22.0
(b) Females over 3 years				
	(i) <i>Breeding</i>			
	(a) <i>In milk</i>	828,821	830,059	(-) 0.1
	(b) <i>Dry and not calved even once</i>	769,423	595,569	(+ ) 29.1
	(ii) <i>Working</i>	37,971	14,503	(+ ) 161.8
	(iii) <i>Others</i>	13,681	33,522	(-) 59.2
	<i>Total</i>	1,649,896	1,473,653	(+ ) 12.0
	(c) <i>Young Stock</i>	1,122,730	947,756	(+ ) 18.5
	<i>Total Buffaloes</i>	3,133,505	2,717,187	(+ ) 15.3

**DELHI**

S.No.	Item	1961 Census (Numbers)	1956 Census (Numbers)	Percentage of increase (+) or decrease (-) of Col. 3 over Col. 4
(1)	(2)	(3)	(4)	(5)
<b>1. CATTLE</b>				
(a)	Males over 3 years			
	(i) <i>Used for breeding only</i>	399	413	(-) 3.4
	(ii) <i>Used for breeding and work both</i>	—		
	(iii) <i>Used for work only</i>	36,725	34,856	(+) 5.4
	(iv) <i>Others</i>	454	483	(-) 6.0
	<i>Total</i>	37,578	35,752	(+) 5.1
(b)	Females over 3 years			
	(i) <i>Breeding</i>			
	(a) <i>In milk</i>	19,200	18,191	(+) 5.5
	(b) <i>Dry and not calved even once</i>	13,760	10,717	(+) 28.4
	(ii) <i>Working</i>	19	124	(-) 84.7
	(iii) <i>Others</i>	230	233	(-) 1.3
	<i>Total</i>	33,209	29,265	(+) 13.5
(a)	Young Stock	18,426	55,293	(-) 66.7
	<i>Total cattle</i>	89,213	120,310	(-) 25.8
<b>2. BUFFALOES</b>				
(a)	Males over 3 years			
	(i) <i>Used for breeding only</i>	285	291	(-) 2.1
	(ii) <i>Used for breeding and work both</i>	551	—	
	(iii) <i>Used for work only</i>	97	589	(-) 83.5
	(iv) <i>Others</i>		145	
	<i>Total</i>	933	1,025	(-) 9.0
(b)	Females over 3 years			
	(i) <i>Breeding</i>			
	(a) <i>In milk</i>	28,350	38,965	(-) 27.2
	(b) <i>Dry and not calved even once</i>	18,450	13,589	(+) 35.8
	(ii) <i>Working</i>	265	398	(-) 33.4
	(iii) <i>Others</i>	380	60	(+) 533.3
	<i>Total</i>	47,445	53,012	(-) 10.5
(c)	Young Stock	12,125	61,192	(-) 80.2
	<i>Total Buffaloes</i>	60,503	115,229	(-) 47.5

**GUJARAT**

S.N.	Item	1961 Census	1956 Census	Percentage of increase (+) or decrease (-) of Col. (3) over Col. 4
(1)	(2)	(3)	(4)	(5)
<b>1. CATTLE</b>				
(a) Males over 3 years				
	(i) <i>Used for breeding only</i>	19,786	17,402	(+ 13.7
	(ii) <i>Used for breeding &amp; work both</i>	40,579	—	
	(iii) <i>Used for work only</i>	2,964,951	2,692,281	(+ 10.1
	(iv) <i>Others</i>	28,721	46,845	(- 38.7
	<i>Total</i>	3,054,037	2,756,528	(+ 10.8
(b) Females over 3 years				
	(i) <i>Breeding</i>			
	(a) <i>In milk</i>	832,818	799,077	(+ 4.2
	(b) <i>Dry &amp; not calved even once</i>	967,655	844,362	(+ 14.6
	(ii) <i>Working</i>	14,774	9,685	(+ 52.5
	(iii) <i>Others</i>	21,147	14,512	(+ 45.7
		1,836,394	1,667,636	(+ 10.1
	(c) <i>Young Stock</i>	1,622,640	1,703,844	(- 4.8
	<i>Total Cattle</i>	6,513,071	6,128,008	(+ 6.3
<b>2. BUFFALOES</b>				
(a) Males over 3 years				
	(i) <i>Used for breeding only</i>	10,675	9,489	(+ 12.5
	(ii) <i>Used for breeding &amp; work both</i>	5,471		
	(iii) <i>Used for work only</i>	21,987	18,344	(+ 19.9
	(iv) <i>Others</i>	4,411	2,588	(+ 70.4
	<i>Total</i>	42,544	30,421	(+ 39.9
(b) Females over 3 years				
	(i) <i>Breeding</i>			
	(a) <i>In Milk</i>	900,996	887,977	(+ 1.5
	(b) <i>Dry and not calved even once</i>	737,834	570,161	(+ 29.5
	(ii) <i>Working</i>	19,698	5,899	(+ 233.9
	(iii) <i>Others</i>	15,806	8,133	(+ 94.3
	<i>Total</i>	1,674,334	1,472,170	(+ 13.7
	(c) <i>Young Stock</i>	1,141,562	1,117,638	(+ 2.1
	<i>Total Buffaloes</i>	2,858,440	2,620,229	(+ 9.1

PUNJAB

S.No.	Item	1961 Census	1956 Census	Percentage of increases (+) de- crease (-) of Col. No. 3 over Col. No. 4
(1)	(2)	(3)	(4)	(5)
<b>1. CATTLE</b>				
(a) Males over 3 years				
	(i) <i>Used for breeding only</i>	8,780	9,412	(-) 6.7
	(ii) <i>Used for breeding &amp; work both</i>	20,378		
	(iii) <i>Used for work only</i>	2,420,110	2,253,482	(-) 8.3
	(iv) <i>Others</i>	5,360	15,089	(-) 64.5
	<i>Total</i>	2,454,628	2,277,983	(+) 7.8
(b) Females over 3 years				
	(i) <i>Breeding</i>			
	(a) <i>In milk</i>	1,035,006	975,771	(+) 6.1
	(b) <i>Dry &amp; not calved even once</i>	649,079	658,314	(-) 1.4
	(ii) <i>Working</i>	4,214	1,566	(+) 169.1
	(iii) <i>Others</i>	25,925	12,768	(+) 103.0
	<i>Total</i>	1,714,224	1,648,419	(+) 4.0
(c) Young stock				
	<i>Total cattle</i>	1,884,515	2,021,736	(-) 6.8
	<i>Total cattle</i>	6,053,367	5,948,138	(+) 1.8
<b>2. BUFFALOES</b>				
(a) Males over 3 years				
	(i) <i>Used for breeding only</i>	9,794	9,517	(+) 2.9
	(ii) <i>Used for breeding &amp; work both</i>	15,834	229,047	(+) 3.9
	(iii) <i>Used for work only</i>	222,119		
	(iv) <i>Others</i>	2,297	3,039	(-) 24.4
	<i>Total</i>	250,044	241,603	(+) 3.5
(b) Females over 3 years				
	(i) <i>Breeding</i>			
	(a) <i>In Milk</i>	1,389,896	1,199,361	(+) 15.9
	(b) <i>Dry and not calved even once</i>	911,086	784,415	(+) 24.1
	(ii) <i>Working</i>	34,091	52,481	(-) 35.0
	(iii) <i>Others</i>	7,353	7,218	(+) 1.9
	<i>Total</i>	2,342,426	1,993,475	(+) 17.5
(c) Young stock				
	<i>Total Buffaloes</i>	1,833,450	1,574,615	(-) 16.4
	<i>Total Buffaloes</i>	4,425,920	3,809,693	(+) 16.2

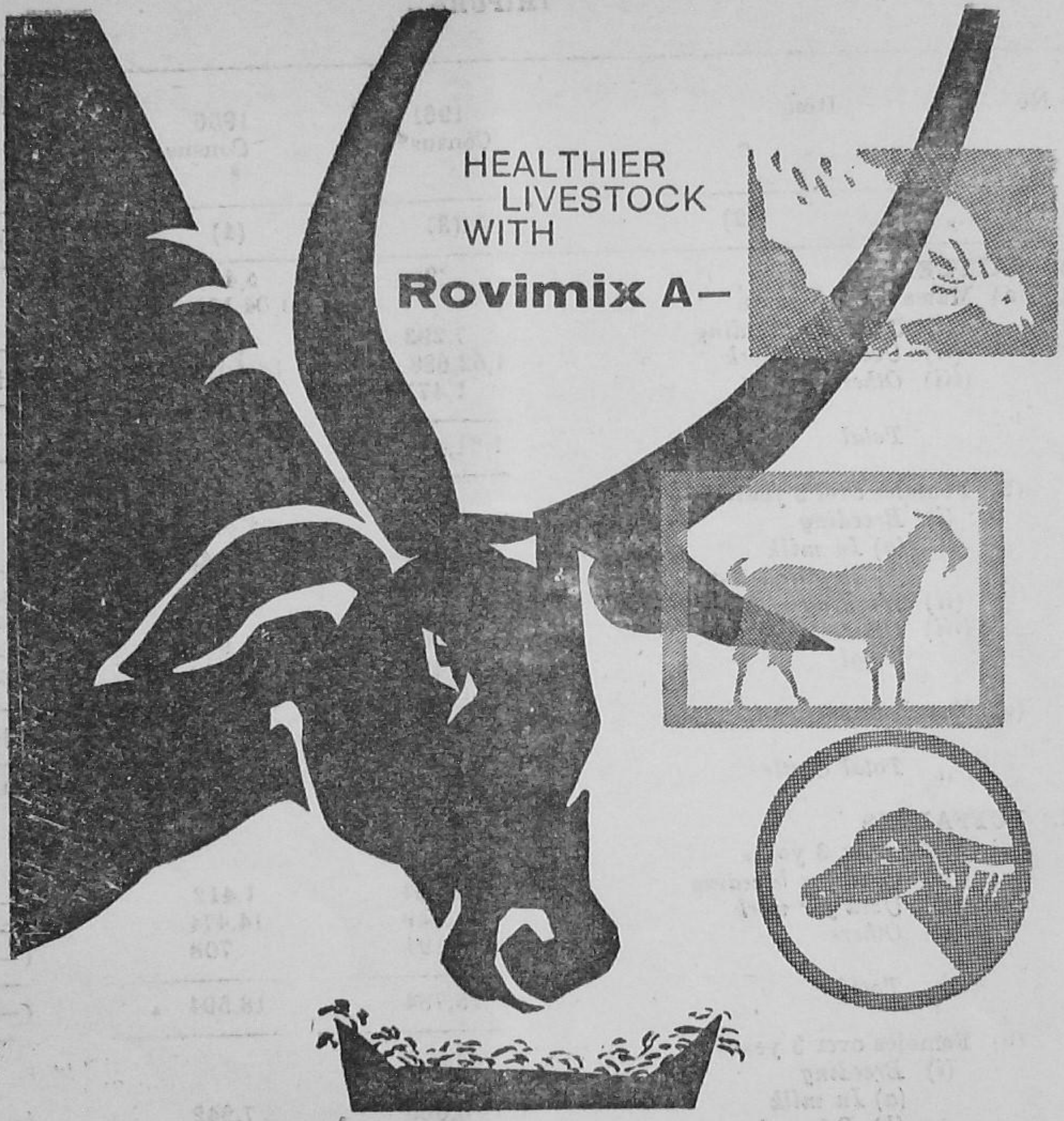
**RAJASTHAN**

S.No.	Item	1961 Census (Numbers)	1956 Census (Numbers)	Percentage of increase (+) or decrease (-) of Col. 3 over Col. 4
(1)	(2)	(3)	(4)	(5)
<b>1. CATTLE</b>				
	(a) Males over 3 years			
	(i) Used for breeding only	16,754	17,625	(-) 4.9
	(ii) Used for breeding & work both	14,276	—	—
	(iii) Used for work only	3,865,073	3,449,787	(+) 12.0
	(iv) Others	71,843	110,637	(-) 35.1
	<i>Total</i>	3,967,946	3,578,049	(+) 10.9
	(b) Females over 3 years			
	(i) Breeding			
	(a) In milk	1,692,503	1,748,743	(-) 3.2
	(b) Dry & not calved even once	3,168,762	2,622,636	(+) 16.4
	(ii) Working	30,959	15,446	(+) 100.4
	(iii) Others	43,003	27,551	(+) 56.1
	<i>Total</i>	4,935,227	4,414,376	(+) 11.8
	(c) Young Stocks	4,266,063	4,080,288	(+) 4.6
	<i>Total Cattle</i>	13,169,236	12,072,713	(+) 9.1
<b>2. BUFFALOES</b>				
	(a) Males over 3 years			
	(i) Used for breeding only	10,688	10,951	(-) 2.4
	(ii) Used for breeding & work both	7,652	—	—
	(iii) Used for work only	1,33,061	1,09,321	(+) 21.7
	(iv) Others	8,308	6,730	(+) 23.4
	<i>Total</i>	1,59,709	1,27,002	(+) 25.8
	(b) Females over 3 years			
	(i) Breeding			
	(a) In milk	9,74,372	8,85,212	(+) 10.1
	(b) Dry and not calved even once	1,090,157	8,71,917	(+) 25.0
	(ii) Working	17,316	8,555	(+) 102.4
	(iii) Others	14,205	7,068	(+) 101.0
	<i>Total</i>	2,096,050	1,772,752	(+) 18.2
	(c) Young stock	1,774,406	1,539,695	(+) 15.2
	<i>Total Buffaloes</i>	4,030,165	3,439,449	(+) 17.2

**TRIPURA**

S.No.	Item	1961 Census*	1956 Census	Percentage of increases (+) or decrease (-) of Col. 3 over Col. 4
(1)	(2)	(3)	(4)	(5)
<b>1. CATTLE</b>				
(a) Males over 3 years				
	(i) <i>Used for breeding</i>	7,293	5,459	(+) 33.8
	(ii) <i>Used for Work</i>	1,52,688	1,04,109	(+) 46.7
	(iii) <i>Others</i>	1,471	3,774	(-) 61.7
	<i>Total</i>	1,61,452	1,13,342	(+) 42.4
(b) Females over 3 years				
	(i) <i>Breeding</i>			
	(a) <i>In milk</i>	89,681	60,550	(+) 48.1
	(b) <i>Dry and not calved</i>	48,809	27,938	(+) 74.7
	(ii) <i>Working</i>	642	315	(+) 103.8
	(iii) <i>Others</i>	5,301	1,981	(+) 167.6
	<i>Total</i>	1,44,433	90,784	(+) 59.1
(c) Young stock				
		1,74,843	98,739	(+) 77.1
	<i>Total Cattle</i>	4,80,728	3,02,865	(+) 58.7
<b>2. BUFFALOES</b>				
(a) Males over 3 years				
	(i) <i>Used for breeding</i>	3,641	1,412	(+) 157.9
	(ii) <i>Used for work</i>	11,949	14,474	(-) 17.4
	(iii) <i>Others</i>	194	708	(-) 72.6
	<i>Total</i>	15,784	18,594	(-) 4.9
(b) Females over 3 years				
	(i) <i>Breeding</i>			
	(a) <i>In milk</i>	6,665	7,242	(-) 8.0
	(b) <i>Dry and not calved</i>	7,426	5,747	(+) 29.2
	(ii) <i>Working</i>	969	298	(+) 225.2
	(iii) <i>Others</i>	1,032	150	(+) 561.5
	<i>Total</i>	16,092	13,443	(+) 19.7
(c) Young stock				
		10,671	10,440	(+) 2.2
	<i>Total Buffaloes</i>	42,547	40,477	(+) 5.1

\*Provisional Figures



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