FOR

GAURABHI CHAMPION SHRAKHLA

(HGM Livestock Selection Programme)

सत्यमेव जयते

Government of India
Ministry of Fisheries Animal Husbandry & Dairying
Department of Animal Husbandry and Dairying

MANUAL FOR SURABHI CHAYAN SHRAKHLA (HGM LIVESTOCK SELECTION PROGRAMME) TO ESTABLISH NATIONAL MILCH HERD

1. Preamble

With estimated milk production of 231 million tons in the year 2022-23, India continues to be the highest milk producer in the world since 1998. India also possesses the largest bovine population in the world consisting of 193.46 million cattle and 109.85 million buffaloes (20th Livestock Census, 2019). Among cattle, the indigenous/non-descript cattle constitute 73.45% (142.11 million) and exotic/crossbred cattle constitute 26.5% (51.36 million) of the total cattle population. In the indigenous/non-descript category, around 70% of cattle are of nondescript type, while the remaining 30% are registered Indigenous breeds.

The bovine genetic resource of the country comprises 53 recognized Indigenous Breeds of cattle and 20 breeds of buffaloes. Country has large number of Gaushals, Gosadans and Pinjrapoles and some of these are repository of elite germplasm of indigenous breeds.

It has been noted during the milk yield completions organized by various States that farmers are maintaining high yielding animals including crossbreds, indigenous cattle breeds and indigenous buffalo breeds.

Several measures have been under taken since independence including implementation of Central Herd registration scheme (CHRS) for identification and location of superior germplasm and creation of herd book of elite animals. At present CHRS has 4 centres covering limited number of animals and herd book of elite animals is also not being created under the scheme. It is also not possible to extend scope of the scheme to other States of the country.

During the fourth 5 year Plan Government of India has established 7 Central cattle breeding farms with objective to maintain elite herd for development of bovine population in the country. At present country has 172 cattle breeding farms including 165 State cattle breeding farms for managing elite animals of indigenous breeds. Role of these farms in genetic upgradation programmes is also limited as quality of herd available at these farms is deteriorating except few farms which have improved herd through implementation of modern reproductive technologies. There is also no system for publication of list of elite animals available at these farms.

Progeny testing programmes and pedigree selection programme initiated by Government of India and ICAR Institutes is also limited to few important indigenous breeds and coverage of these programmes is also limited to few States.

With this backdrop it is essential to identify and locate high yielding animals available throughout the country and there is also need to evolve a system that list of the high yielding animals available to other farmers/ entrepreneurs and other stake holders. Local veterinarians and State Animal Husbandry Departments can play important role in identification and location of elite animals. For proving genetic merit of high yielding identified animals latest techniques such as genomic testing may be used or animals may be brought under the coverage of Surabhi Chayan Shrakhla (HGM Livestock Selection Programme).

This document describes institutional framework required for identification and location of superior germplasm across the country. Provision will be made in Bharat Pashudhan for uploading list of high yielding animals available in the country. This attempt will help in establishment of National Milch Herd in the country. This will also give boost to development and conservation of indigenous bovine breeds.

2. Objectives

The major objectives of the programme

3.6 Elite animals available in Gaushalas/ Gosadans/ Puinjarapoles in jurisdiction of local veterinarians may also be identified and their data shall be uploaded on the Bharat Pashudhan data base.

3.7 Incentive shall be made available to the farmer rearing elite animals in the form of breeding of elite animals with the semen of elitist of elite bull available in the country and certification of elite animal, tissue sample may be drawn from identified elite animals and may be sent to NDDB for genomic testing.

3.8 High yielding / elite animals identified during milk yield competitions shall be registered by the local veterinarian and their data shall be uploaded on Bharat Pashudhan data base.

3.9 Local veterinarian shall submit list of elite animals available in his area to District Animal Husbandry Officer for verification of the data.

4. Verification of data generated for elite animals

4.1 District Animal Husbandry officer shall verify list of elite animals reported by local veterinarian during his visit to Veterinary Hospital/ Dispensary in the district.

4.2 DAHO may take meeting of Veterinarians in the district and create awareness among veterinarians for identification and location of elite animals. DAHO may give targets to veterinarians to maintain record of at least 10 elite animals available in their area.

4.3 DAHO shall arrange elitist of elite bull semen for elite animals identified in the district for further genetic upgradation of elite animals. DAHO may take strict action against veterinarians for breeding elite animals with semen of bulls with low genetic potential.

4.4 DAHO shall make arrangement for proper disease testing of elite animals in the district disease investigation lab.

4.5 DAHO shall create awareness among the farmers about rearing of high yielding milch animals from the funds made available to the States under the schemes being implemented by Department of Animal Husbandry & Dairying Govt of India.

4.6 DAHO shall compile list of elite animals available in the district and submit list to Director Animal Husbandry of the State.

5. Uploading List of elite animals on the website

5.1 Director Animal Husbandry of the State shall prepare minimum standards and specifications for identification and location of elite animals. For preparing standards and specification minimum standards given in the MSP for semen production may be used.

5.2 Data on elite animals received from DAHOs shall be verified and some of the elite animals may be brought under scientific milk recording programme (Refer Annexure-I).

5.3 Certificate shall be issued to the owners of the elite animals after proper verification.

5.4 List of elite animals received from all the DAHOs shall be compiled and posted on the website of the State Department of Animal Husbandry. Compiled list shall be submitted to Department of Animal Husbandry & Dairying Government of India,

6. Establishment of National Milch Herd

6.1 DAHD shall compile list of the elite animals received from the States and same shall be posted on the website of the Department.

6.2 DAHD shall provide necessary support to the States for genomic testing of identified elite animals.

Annexure – I

Standard Operating Procedure for implementing SURABHI CHAYAN SHRAKHLA (HGM Livestock Selection Programme) for Cattle and Buffalo

Foreword

In dairy sector, performance recording of bovines forms an integral part of scientific animal husbandry practices for the ultimate benefit and further upliftment of socio-economic status of livestock owners. The performance comparison of various breeds in different geographical areas and in different conditions provide valuable information on breed compatibility, cost economics of production, impact of various interventions and policies required in various areas for enhancing productivity of bovines.

It also serves as the basis for selection of animals for scientific breeding to produce next generation offspring, expected to provide better profits to livestock owners though increased milk productivity. Progeny Testing (PT) and Pedigree Selection (PS) programmes implemented under Rashtriya Gokul Mission are source of animal wise reliable performance data on milk production, milk composition and reproduction aspects of cattle and buffaloes. The data at present is used in selection programme and implementation of Genomic Selection for selection of heifers and bulls

However, PT/PS programmes have their practical limitation in geographical spread. They can exploit maximum benefit if larger reference population for various breeds of bovines is available.

Surabhi Chayan Shrakhla (HGM Livestock Selection Programme) is aimed to implement performance recording of bovines throughout the country, capturing untapped geographies, with wide scale/coverage, to address existing gaps and further improve our efforts for speedy productivity enhancement, ultimately benefitting livestock owners.

Objectives of the Programme

The main objectives of the Surabhi Chayan Shrakhla (HGM Livestock Selection programme) are:

- To locate superior germplasm in breeding tracts / milk pockets
- To introduce systematic milk recording and promote breeding with HGM bulls
- To calculate genetic gain among bovines
- To collect and publish production and breeding records of registered animals

- To create awareness among farmers and improve their income Surabhi Chayan Shrakhla (HGM Livestock Selection programme) would be implemented across the country in modular form. Initially, 45 milk recording units (other than those of PT/PS projects) would be identified wherein milk recording could be conducted by identified Participating Agencies (PA) which may include Milk Unions, State AHDs, State LDBs, Vet. Colleges, ICAR institutions, Trusts, NGOs etc..

Each such milk recording unit (similar to a PS project) would milk record animals in identified 45 milk recording centres following Standard Operating Procedures (SOP) that follow.

Standard Operating Procedures (SOP) Operational area

Surabhi Chayan Shrakhla (HGM Livestock Selection programme) for a breed shall be taken up in a compact area/centre/village where at least 1000 breedable animals are available. In case of a cluster centre, only as many villages around the main centre where close follow up, milk recording, supervision and monitoring of the activities is possible shall be included in the programme.

Animal Identification

All animals enrolled under the project shall be identified by applying ear tags.

Only polyurethane laser printed ear tags having a 12 digit number and a bar code shall be used. The numbering system followed shall be unique with the last digit of the number being a "check digit" to ensure that no two animals are tagged with the same number. Only numbers supplied by an agency identified by DAHD shall be used for unique identification of animals.

Figure A.1: Ear Tag

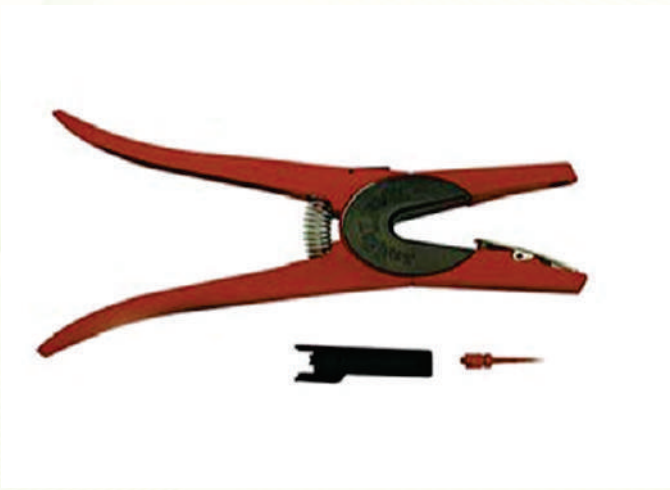

Figure A.2: Tag Applicator

The specifications for the ear tag shall be: The male tag as a button shall be with a minimum diameter of 27 mm with a metal point and the flag shaped female tag with a closed head shall be with a minimum size of 55 x 65 mm. 12 digits to be printed in two rows of six digits each; second/lower six digits shall be relatively much larger than first/upper six digits.

Figure A.3: Ear Tagged animal

The ear tag shall be applied inside the ear of animals, in the centre of the ear lobe with the female part of the tag inside the ear.

If the ear tag falls off, a new ear tag shall be applied within 10 days and the information shall be immediately updated in Bharat Pashudhan system.

Milk Recording

The key points to be considered for milk recording include:

a. Animal in any lactation may be considered for inducting under milk recording.

b. Preference may be given to farmers having larger herd size. In such case, all animals in his herd shall be recorded.

c. Preference shall also be given to younger animal rather than very aged/diseased animal (either currently or in the past).

d. The milk recording work shall be assigned to exclusive milk recorders who have no other assignments during milk recording timings.

e. An area assigned to one milk recorder would depend on the number of animals under milk recording and the spread of animals.

g. First recording shall be carried out on or after 5 days of calving and not later than 25 days of calving.

h. Milk recording for an animal shall be done once a month, morning and evening on the same day (also in the afternoon if three times milking is practiced) preferably on a fixed day of the month (plus or minus 5 days) at the place of milking.

l. A monthly milk recording schedule shall be prepared, detailing the animal to be recorded, order of recording, name, address and contact number of the farmer, name of the village, date and time of recording.

j. Milk recording shall be carried out using a GPS enabled Smart weighing scale (SWS) or weighing scale that can transmit data to mobile device having Bharat Pashudhan syatem directly. Total quantity of milk produced by the animal at farmers' household shall be weighed using the SWS along with GPS Coordinates (Latitude and Longitude). Captured data shall be forwarded to Bharat Pashudhan system.

Figure A.4: Smart Weighing Scale

k. On each day of milk recording, a milk sample shall be taken in a sample bottle (during morning recording), properly labelled, recorded and sent to a laboratory for milk component analysis for fat, SNF, protein etc.

l. Every animal shall be recorded both for milk volume and milk components on a monthly basis continuously for 11 times or until the animal becomes dry or is permanently lost from the system whichever is earlier.

k. On each day of milk recording, a milk sample shall be taken in a sample bottle (during morning recording), properly labelled, recorded and sent to a laboratory for milk component analysis for fat, SNF, protein etc.

m. If the animal becomes dry before 11 recordings, the dry date shall be recorded invariably.

n. If weaning is not practiced by the farmer or if the farmer could not be motivated to practice weaning, at least on the day of milk recording, the calf shall not be allowed to suckle its mother and the particulars shall be recorded in Bharat Pashudhan system. Milk collected from all four quarters shall be measured and the farmer shall be advised to feed the calf separately.

o. Except during late lactations, milk yield shall not be recorded on the day when it has dropped by 50% of the previous recording (respective morning or evening recording) or when the animal is suffering from some form of illness. In such cases, the reason for drop shall be recorded and the milk recording shall be reattempted after a period of at least five days.

p. If the animal is milked only one time, then only that shall be recorded and the other timing shall be left blank or recorded zero.

q. The milk recorder shall also record the details of the milk recordings in a milk recording card that is kept with the animal owner.

r. Standard Lactation Yield of the milk recorded animal shall be calculated using the Test Interval Method described by International Committee for Animal Recording (ICAR).

Blood collection, labelling, storage and dispatch

a. Blood sample for genomic reference population should be collected from all the animals that has completed 6 milk records

b. Blood shall be collected either from jugular vein or coccygeal vein after proper restrain of animal.

c. It shall be ensured that puncture site is cleaned using antiseptic, especially if blood is collected from coccygeal vein. Hairs may be clipped if pose chances of contamination.

d. Blood shall be collected using violet cap EDTA vacutainers (4-5 ml is minimum required quantity) having capacity of 6 ml draw volume or more, vacutainer needles 20 G, 1 to 1.5 inch and needle holder.

e. Once blood is drawn, it shall be ensured that tube is removed from vein without removing needle to avoid entry of contaminated air in vacutainer. Once tube is removed, the needle should be removed from the vein and animal should be unrestrained.

f. Tube shall gently be inverted twice or thrice so that EDTA mixes well with blood.

g. Vacutainers shall immediately be labelled with permanent marker pen mentioning complete ear tag number of the animal.

h. Vacutainers shall be kept in the base provided with vacutainer in the chiller/Thermocol box filled with cooled gel packs (pre-freezed at -18° C at least 12 hours before start of actual blood collection in a deep freezer or freezer of a refrigerator).

i. Care shall be taken not to expose vacutainers directly to the sunlight or heat as this may cause hemolysis.

j. Transportation of blood from village to project office shall be done in chillers/ Thermocol box with gel packs (4-6 packs per box depending on size).

k. Once blood is received at project office, it shall immediately be transferred to refrigerator (4° C) and maintained till dispatch for at least 12 hours.

l. Samples shall be dispatched vertically in the thermocol box along with the frozen gel packs on all sides of the blood sample to ensure that blood sample is delivered in chill condition (2° to 6° C), to minimize hemolysis.

m. Thermocol box shall be tightly packed with adhesive tape so that it is does not open during transportation.

n. Along with blood sample, details of animals in prescribed format should be send both in hard copy and excel soft copy to the laboratory.

Tissue sample collection, labelling, storage and dispatch

a. In case it is very difficult to restrain the animal, tissue sampling units may be used to collect ear tissue sample from the animal that has completed 6 milk records.

b. A separate sampling unit and its sample collection pin should be used for each animal.

c. The sample should be collected from the tip of the ear or the area of ear where there are no visible veins.

d. The head of the animal should be restrained properly before start of sample collection

e. Sample collection site should be cleaned from all the grease and dirt and should be sterilized with sprit.

f. Tissue sampling unit should be prepared as per instruction of the manufacturer and tissue sample should be collected with single swift movement. The sampling applicator should be released quickly after sample collection to avoid injury to animal.

g. Ensure that the tissue sample is inside the tube. This is indicated by the presence of red stopper in the sampling tube.

h. Animal should be unrestrained as soon as sample collection is completed.

i. The sample sticker from the tissue sampling unit should be taken out and should be pasted against the animal id on the sample sheet. Sampling unit is self-labelled hence there is no need to put identity on the unit.

j. The sampling unit should be properly packed in the plastic zip pouch provided along with the unit with one sticker on the pouch.

k. All the samples collected on same day should be packed together in a larger plastic zip pouch and a copy of sample sheet showing animal identity and sample code sticker against each id, should be placed inside the pouch.

l. The pouch can be stored at room temperature or at 4 degrees in refrigerator.

m. Samples should be dispatched to the laboratory at room temperature within 15 days of collection.

n. A scanned copy of sample sheet with animal ID and sample sticker with sample code against each id should be sent to the laboratory.

Procedures for supervision

For checking the milk recordings, the supervisor shall conduct the following:

a. Surprise checking: a surprise check by visiting the site of milking, at the time of the scheduled milk recording and check the procedure of recording, the records and the functionality of the equipment used.

b. Validation check: Alternatively, the supervisor, on the day of visit to a particular village, shall visit a randomly selected animal, which is currently under recording, at the time of milking and measure the quantity of milk produced and record the data. This shall be used to compare the preceding milk recording data of the same animal.

c. Checking difference between GPS coordinates of milk recordings of same animal and physically verifying differences if any.

d. In addition to supervisors, activities shall also be supervised and monitored by other officers through regular and surprise field visits for checking of milk recording and post milk recording validations, review meetings etc.

Collection of reproduction details, disease incidence and feeding information

a. As far as possible, the Participating Agency will arrange to record all inseminations, Pregnancy Diagnosis and calving information on animals under milk recording.

b. EIA will also arrange to record all treatment done to the animal under milk recording by a veterinarian in the area.

c. The milk recorder will fill up a details of disease occurrences to the animal under milk recording at each milk recording day by asking relevant questions to the farmer.

d. The supervisor will conduct a quarterly survey for each animal under milk recording and collect information about feeding practices and cost of various feed ingredients.

Information System

All data related to Surabhi Chayan Shrakhla (HGM Livestock Selection programme) recording shall be captured through Bharat Pashudhan