LEAGUE OF ARAB STATES

ARAB ORGANIZATION FOR AGRICULTURAL DEVELOPMENT

KHARTOUM

# A PROPOSAL

# FOR ORGANIZING ARTIFICIAL INSEMINATION SERVICES

# AND DEVELOPING A BREEDING POLICY

# FOR CATTLE IMPROVEMENT

# IN

# THE DEMOCRATIC REPUBLIC OF SOMALIA


MARCH 1984

# FORWARD

During my visit to the Democratic Republic of Somalia in October, 1981, it was clear to me that great attention has been paid by the Ministry of Livestock, Forestry and Range ( MLFR) to Artificial Insemination ( AI ) Service. Efforts and equipments were also provided by some foreign agencies to strengthen the AI - Center at Afgoi. However, the need for a working plan that includes both AI service and breeding policy in such a way to attain maximum improvement of cattle through the rational utilization of the existing resources and facilities was obvious.

In response to the request of the MLFR, a team of experts was recruited by the Arab Organization for Agricultural Development (AOAD ) to study the existing situation of AI and breeding systems, and to propose a plan for organizing AI field work, and designing a work plan for the future breeding policy to improve the genetic make up of the indigenous cattle in view of the already started frozen semen programme.

This report presents an outline of the proposed major plan and supporting activities. The plan is supposed to cover the areas surrounding the AI Center at Afgoi in its first phase serving an estimated cattle population of about 70,000 heads. In phase II, the AI service will be extended to other regions of the country.

On behalf of the AOAD, I would like to express my appreciation to H. E. Dr. Mohammed Ali Nour, Minister of the MLFR and his staff for the care that the team of experts has received. I sincerely hope that this report will be of use to the livestock improvement plan in Somalia.

H. F.

Dr. Hassan Fahmi Jumah
DIRECTOR GENERAL
AOAD

ACKNOWLEDGEMENT

The AOAD team of consultants likes to express his deep gratitude to H. E. Dr. Mohamed Ali Nour, Minister of the MFLR for his valuable advice and discussions. A great appreciation is also extended to Mr. Abdul-Rahman Haj Nour, D. G., MLFR who provided all facilities for the success of the mission.

It has been a great pleasure to work with the staff of the MLFR, especially Mr. Abdullah Farah Egal, Director of Afgoi AI - Center who willingly accompanied the consultants in their visits and field trips.

The team of consultants is most grateful to H. E. Dr. Hassan Fahmi Jumah, D. G., AOAD, for granting them the opportunity to conduct the present study.

Dr. Farouk Al Dasouky

Dr.Ahmed Abdul Azia

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# SUMMARY OF RECOMMENDATIONS

## SUMMARY OF RECOMMENDATIONS

In 1976, an AI Center was established at Afgoi, about 30 km away from Mogadishu to produce fresh semen and provide services to the nearby state farms. Recently, the policy has been shifted to the production of frozen semen . Technical assistance, vehicles and equipments were provided by foreign agencies, and frozen semen was donated by the FAO through the International semen Donation scheme. However, the AI service is still confined to a limited number of herds. The need for a comprehensive plan to combine AI service with a well defined breeding policy becomes crucial. The following is a summary of the recommendations proposed by the consultants recruited by the AOAD for this purpose.

1. Improving Existing AI Facilities :

1.1. The Liquid Nitrogen Plant and Generators :

A stand-by 106 liquid nitrogen producing plant should be added to the existing one to avoid unexpected shortage in liquid nitrogen and for the planned expansion of the AI programme. A vertical 1800 - liter tank for storing liquid nitrogen would be connected with the two plants. A list of spare parts necessary for running the apparatus safely in the next three years under tropical conditions is given. A slight adjustment was proposed for operating the stand-by generators properly.

1.2. Laboratory ; Field Training and Field Equipments :

The consultants advised an improved method for semen evaluation. A set of equipments is needed for facilitating the work in the semen lab. The set includes an automatic straw printing machine with all accessories, manual machine for counting and packing medium straws in three different sizes of goblets with all accessories, trinoculair phase- contrast microscope with worm stage , automatic machine for

filling and sealing medium straws, and laiciphos 478 dilutor.

A mechanical cow provided with both heifer and cow uteri, three special syringes, 12 screwable searing heads, a battery with charger, sufficient numbers of kits and instruments for field work are recommended for field training and field work.

1.3 Semen Collection and Transportation :

A complete dummy cow is needed for semen collection. Five sidecar motorcycles, two 4-wheel drive field cars, one extension car and one mini-bus are needed for proper transportation.

2. Recommended AI Work Plan :

2.1. Phase I :

Supporting and activation of the existing facilities will be considered in this phase which will last for three years during which AI service will cover three selected areas : Mogadishu, Gidka Afgoi-Warmahan, and Gidaka Afgoi-Shalambot. This phase includes the establishment of a network of AI subcenters, and the production of 101,000 medium frozen semen straws annually to complete the 130,000 doses needed for the estimated cattle population of 70,000 heads located in the suggested areas. The number of the needed straws will be provided by the FAO .

2.2 Phase II :

Future subcenters at Hargeisa and Kismayo will be established in Phase II. Main features of this phase will be the installation of liquid nitrogen production plants at selected sites in both regions. Frozen semen supply will be maintained by the semen producing unit at Afgoi after increasing its capacity.

## 3. Supporting Activities to the AI Programme :

### 3.1. Training :

Three training courses were recommended for improving the capabilities of six Somali technicians. The courses are : Pregnancy Diagnosis and Reproductive Diseases ( 3 wk), Straw Processing ( 8 wk) and maintenance and repair of liquid Nitrogen Plants ( 6 wk ) . The courses may be conducted out of country and arranged by the MINEADEP.

Besides, two in-service training courses in sexual Health Control for 5 - 7 Somali Veterinarians ( 8 wk), and in AI Techniques for lay inseminators and technicians ( 8 wk).

### 3.2. Extension :

Extension services will be provided for technicians and farmers to support the AI programme. Veterinary services can also be included in the extension programme.

### 3.3. Sexual Health Control :

The establishment of a central laboratory for the diagnosis of the common venereal diseases is strongly recommended. A project for surveying the incidence of these diseases is necessary for sexual health control. The project must be followed by a programme for control and eradication of the most common venereal diseases. A Scheme for diagnosis and treatment of infertility, early pregnancy diagnosis and handling of post-partum problems should be introduced.

### 3.4. Identification and Recording for AI Purposes :

A system that depends on a reliable method for ear tagging is needed for individual identification. A recording system based on non-return rates is essential for providing early estimates of actual pregnancy rates.

## 4. Recommended Breeding Policy :

### 4.1. Framework :

In Somalia, large differences exist among herds due to the variable environmental conditions and the different systems of production under which animals are kept. In such cases, a stratified scheme may be developed where the breeds involved in the breeding plan and the system of mating used vary according to ecological conditions, feed resources, management systems, and capability of disease control.

### 4.2. Breeds and Breeding Systems :

4.2.1. Upgrading indigenous breeds by Friesian Blood can be used in State Farms, municipal Farms and in the herds of the small holders in Mogadishu area. An- inter-se scheme of mating crossbred females to crossbred bulls is considered when it is desired to stabilize certain percentages of the blood of the breeds involved.

4.2.2. For harsher conditions, the Sahiwal, Butana , or the Australian Milking Zebu can be used as a site breed instead of the Friesian .

4.2.3. For the most adverse conditions, Dwara and Boran are retained and a selection programm may be carried out through the use of progeny tested bulls and distribution of improved stock. The system should be simple in which the farmers deal with only one type of animals.

## 5. Supporting Activities to the Breeding Policy :

### 5.1. Cattle Identification and Recording :

Careful identification of calves is necessary immediately after birth. The method used should be able to identify the individual, its

breed, and grade.

Systems of recording must vary in degree of complexity. A simple system can be developed to provide base line data on survival, production and reproduction of animals taken from sampled herds. The second step is to include more trails of economical importance that can be easily measured with a reasonable degree of accuracy. Written records usually used in State Farms can be considered as a valuable source of information on trails that need skill and equipments for measurement.

5.2. Training :

Two out-of-country training courses are recommended. The first is in livestock recording and analysis of data for two livestock specialists ( 1 year). The second is in animal breeding, including progen y testing for another two livestock specialists.

An in-service training course for technicians in cattle identification and recording can be arranged ( 8 wk.).

5.3. Extension :

A demonstration programme can be developed which may include fodder production, pasture management, proper livestock feeding, production systems, cattle identification, recording, handling and marketing of animal products.

5.4. Technical Assistance :

A two-phase technical assistance programme, is proposed. In phase I an expert in livestock identification and recording ( one year), a consultant in Cattle Breeding ( two years ) and an expatriate technician in cattle Identification ( one year) are needed to design and supervise the breeding programme until efficient local staff is available.

In phase II, an expert in data analysis is recommended for a two-years consultancy mission to analyze and interpret the data that will be accumulated.

## 6. Financial Support to the Proposal :

The outlined proposal needs urgent financial support from International, Foreign, and Arab Agencies which are interested in agricultural development and livestock improvement. Recommended areas for participation by the AOAD may be :-

(1) providing field equipments for AI, training and extension,
(2) providing transportation facilities, and
(3) financing training and technical assistance programmes.

# CHAPTER 1

# BACKGROUND

# CHAPTER I

# BACKGROUND

## 1.1. INTRODUCTION :

According to the five - year development plan ( 1982 - 1986 ), livestock animal products account for about 80% of the export revenues. The current system of livestock production is based on an extensive and mobile scheme of grazing adapted to the natural characteristics of the country. Under the last two development plans ( 1974 - 1978) and ( 1979 - 1981), 60 projects were supposed to be implemented. But unfortunately, some problems besetting the country resulted in a declining rate of implementation in both programmes, and consequently, few development targets were achieved.

In order to achieve broad objectives of the livestock sector, the recent programme will emphasize on effective management of existing projects, reserve progressive development of modern animal production systems, and support services and training.

## 1.2. TERMS OF REFERENCE :

In response to the request submitted by the Ministry of Livestock, Forestry and Range ( MLFR), in Somalia a team of experts, was recruited by the Arab Organization for Agricultural Development ( AOAD ) for a 21 - day mission to assist in organization of AI services and breeding policy.

The team of experts comprised :-

1) Dr. Farouk I. Dessouky, AI Consultant, Middle and Near East regional Animal Health and Production Project ( MINEADEP), Baghdad, Iraq,

2) Dr. Ahmed S. Abdel-Aziz, Professor of Animal Breeding, College of Agriculture, Cairo University, Egypt.

3) Mr. Walid A. El Sameraee, Expert in the operation and repair of AI - equipments, MINEADEP, Baghdad, Iraq.

Assignment of the team of experts was to forward assistance to the national staff in the following aspects :-

1) Organizing the AI - field service in the country and strengthening the already started frozen semen programme.

2) Designing a work plan for the future breeding policy to improve the genetic make up of the indigenous cattle.

3) Suggesting programmes for training the professional and technical staff.

4) Repairing and maintaining the existing liquid nitrogen producing 106 plant and the instruments used for frozen semen processing.

5) Preparing a list of necessary instruments and spare parts required for both semen processing and liquid nitrogen production.

1.3 PROGRAMME OF THE MISSION :

The mission assembled at the headquarters of the AOAD in Khartoum on September 4, 1982 for briefing, and proceeded for Mogadishu on September 6, 1982.

A series of meetings, visits and field trips were carried on to discuss and investigate the existing situation and future objectives and prospectives. At the end of the mission a summing-up meeting was headed

by H. E.Dr. Mohamed Ali Nour, Minister MLFR for a comprehensive review of the mission's report.

1.3.1. Meetings :

1) Mr. Abdul Rahman Haj Nour
Director General, MLFR.

2) Mr. Farah Rage Gama
Director, Animal Prod. Dept., MLFR.

3) Mr. Abdullah Farah Egal
Director, Afgoi AI - Center, MLFR.

4) Mr. Ibrahim Osman
Director, Afgoi Dairy Farm, MLFR.

5) Mr. Ismail Alim Nouh
Director, Dept. of Research, Planning and Extension, MLFR.

6) Mr. Ali Youssef Ahmed
Director, Veterinary Dept., MLFR.

7) Mr. Abdi Youssef Dualeh
General Manager, Banadir Dairy Project.

8) Mr. Mohamed Kamel Shawky
FAO Country Representative, Mogadishu.

9) Dr. Hani Afifi
Team Leader, Strenthening Planning Depts in MLFR, FAO

10) Mr. Tonny Wilby
Livestock Advisor, FAO

11) Mr. Ken Roudolph
USAID Mission in Somalia

12) Mr. Frank Procella
Expatriate Technician USAID

1.3.2. Visits and Field Trips :

1) Afgoi ( 21st October) Dairy Farm, Afgoi
2) AI - Center, Afgoi.
3) Warmuhan Farm and Cites proposed for AI subcenters in the area.
4) Gianale - Merka District and Villages proposed as cites for AI - subcenters in the district.
5) Municipal Farm, Mogadishu
6) Cites of some crush-points around Afgoi.

1.3.3. Previous Reports and Studies :

1) Rational Development of Livestock Sector in Democratic Republic of Somalia, 1978, AOAD, Khartoum.

2) Feasibility Study of the Establishment of Modern Dairy Farm in Democratic Republic of Somalia, 1978, AOAD , Khartoum.

3) The Five Year Development Plan 1982-86, Draft, Ministry of National Planning, Mogadishu.

4) Report on a short-term Mission to Somalia Under the AI & Breeding Dev. Prog., By Bengb Lundgren, 1980, FAO.

# CHAPTER II

# ARTIFICIAL INSEMINATION

## CHAPTER II
## ARTIFICIAL INSEMINATION

### 2.1. PRESENT SITUATION :

A German-design AI - Center was established at Afgoi in 1976. The Center produced only fresh semen and provided services to the near-by state farms.

The center has been shifted recently to frozen semen programme by installing liquid nitrogen production and storage equipments at Afgoi, and equipping three small sub-centers in order that AI services could be extended to farmers' private stocks.

Technical assistance, some vehicles and equipments were provided by USAID during 1980/81, and an agreement was reached with the FAO for participation in the International Semen Donation Scheme. Maintenance and repair of some laboratory equipments were provided by the Dutch Government.

The recent USAID programme is supposed to terminate in January 1983. Field work and extension services have not received any external support.

#### 2.1.1. Staff :

1 Manager, Technician, 2 years training in Germany, 1 month training at MINEADEP

I Expatriate technician, USAID
1 Lab. Technician, 2 years training in Cuba
1 Lab. Technician, 1 month training MINEADEP
2 Lab. Technicians

1 A I - recording technician
9 Inseminators
16 Total

2.1.2. Buildings :

The laboratory building is large and quite satisfactory for large scale evaluation, processing and storage of semen . It contains the followings :-

1) A semen - collection yard, close to bull stable ; equipped with good facilities and connected with the semen laboratory.

2) A sterilizing room, directly connected with the semen laboratory.

3) A very large semen laboratory for evaluation and processing of frozen semen.

4) A well ventilated store for semen distribution in which there are a large number of cryogenic containers of different sizes for storing liquid nitrogen and semen.

5) A Lavatory and changing room.

2.1.3. Bull Stable :

A well constructed stable to room 15 bulls. The stable is at a small distance ( about 20 m) from the laboratory building. At present, there are only seven bulls :-

2 7 year old Friesian bulls
1 Young Friesian bull

1 Sahiwal bull

2 $F_2$ Friesian X Dwara Bulls

1 Dwara Bull

Semen collected weekly on saturdays, usually from Friesian bulls, to process 200 - 300 medium straws. Farmers can watch the bulls during their exercise to choose the bulls from which they wish to inseminate their cows.

Land for producing green fodder for the bulls is available.

2.1.4. Administration Buildings :

The administration building is close to the AI Center and contains several suitable offices. It also contains a 30 - trainee lecture hall for training courses and seminars. There is also a small library, but visual aids are lacking.

2.1.5. The Liquid Nitrogen Producing Plant :

Liquid nitrogen is not available as a by-product in the country. To overcome this problem, a 106 philips liquid nitrogen producing plant has been installed in a separate building connected with a chiller and 200 liters storage cryogenic container equipped with the necessary pumping system. The plant started its production on March 3, 1982 under the supervision of a USAID consultant assisted by two Somali Technicians. One of the assistants was trained at the Cryogenic Dept., Phillips, Endohover, Holland. The plant is operated for 48 hr/week producing an average of 6 litres/ hr. of liquid nitrogen of high priority.

To avoid failure of electric power, the plant was equipped with two 35 KV diesel stand-by generators, one of them is working. There is also a 50 KV Diesel generator feeding the whole AI Center and the plant.

2.1.6. Equipments and Transportation :

The laboratory was fully equipped with all equipments required for medium straw processing by USAID. However, few items needed to speed up the operation are missing. Biological containers for storing semen and liquid nitrogen are available in abundant.

Available 4-wheel-drive vehicles for semen distribution and field work are quite enough for the recent plan of AI services.

2.1.7. Artificial Insemination Field Work :

AI activities are carried out by lay-inseminators at 21st October farm at Afgoi, Warmahen Ranch, and the two municipal Dairy Farms in Mogadishu. Semen donated by FAO and the locally processed Friesian semen are used in insemination. Each inseminator is provided with a well equipped inseminator kit and biological container. The universal inseminator gun is applied. Pregnancy diagnosis to follow-up AI results is carried out by technicians trained locally.

2.1.8. Recording System :

Records concerning semen collection, sexual behaviour of bulls, evaluation of semen, dilution, processing and distribution are kept at the AI center.

Regarding field insemination, tatoing is used for identification.

The system needs improvement in such a way to allow for regular flow of information on fertility of the animals using AI from the farms to the AI Center.

2.1.9. Sexual Health Control :

The sexual health control services are lacking in the country.

Veterinarians with all-round knowledge of reproductive disease control and special experience in the diagnosis and control of venereal diseases are available.

There is no accurate figure or real survey for any of the diseases causing infertility in livestock. However, most preliminary surveys showed that Brucella is a serious problem in the north (21.2% of the cattle population ; Hargeisa Slaughter House ; 1977). Moreover, sexual health control services are neither covered by animal Health nor in Animal Production Departments of MLFR.

2.1.10. Training :

Training of technicians is carried out by the local staff of the AI Center at Afgoi assisted by the USAID consultant. The middle-level programme lasts for four weeks and could be increased to eight weeks. Theoretical lectures are given at the training hall. Practical training in semen collection, evaluation and processing is held at the AI center while insemination and pregnancy diagnosis training is done on culled cows at 21st October Farm on a limited scale. Few genetalia obtained from a nearby slaughter house are used in training. Some printed lectures and few manuals are available.

Fortunately, members of the mission attended, as representatives of the AOAD, the graduation ceremony of a group of about 10 participants who completed a training course on September 12, 1982.

2.1.11. Extension Service :

Extension programmes about the advatnages of AI Sexual health control, and improved techniques of livestock production are wholly lacking.

## 2.2. RECOMMENDATIONS FOR IMPROVING EXISTING AI FACILITIES :

Since the AI center has received some laboratory equipments and assistance from the USAID, FAO, and Dutch Government, the AOAD consultants believe that further assistance must be directed towards the improvement of laboratory functions and AI field work.

### 2.2.1. The Liquid Nitrogen Plant :

As there is no other supply of liquid nitrogen in the country, and to avoid problems resulting from a sudden break down of the liquid nitrogen plant, a stand-by second 106 plant is strongly recommended. It could be installed in the same building. The second plant would also contribute in covering any further demand of liquid nitrogen due to future expansion of the AI programme. In this case, a vertical 1800 - Liter tank for storing liquid nitrogen should be connected with the two plants.

In screening the spare parts of the existing plant, it was noticed the urgent need for the following items which are necessary for running the apparatus safely in the following three years under tropical conditions :-

| Item | Quantity | |
|---|---|---|
| - Regenerator | 3 | |
| - Helium cylinder | 3 | |
| - Machine Oil | 10 | Gallons |
| - Oil drier | 5 | " |
| - Gas drier | 5 | " |
| - Defrost | 1 | |
| - Start delta switch box | 1 | |
| - Rubber between column and condensor | 12 | |
| - Compressor for the chiller | 1 | |
| - Voltage amper | 1 | |
| - Welding apparatus for pipes | 1 | |

2.2.2. The Generators :

It was noticed that the stand-by generators were not working properly. The consultants suggested the decrease of the load occuring on the generators by adjusting the helium pressure from Bar 25 to Bar 23 - However, this would decrease the liquid nitrogen production by ½ liter/ hr. shifting the site of the generators a little bit closer to the plant was also proposed.

2.2.3. Laboratory Equipments :

The mission advised the use of a proper method to have a very accurate judgement of semen evaluation by warming the slide instead of using the electric light lamps. Proper thawing and defection of live sperms were demonstrated . The consultants suggested that the following equipments would be essential for speeding up and facilitating the work in the semen laboratory.

1) Automatic straw printing machine, with all accessories, and necessary ink and cleaner.

2) Manual machine for counting and packing the frozen medium straws in three different sizes of goblets, with all accessories.

3) Trinoculair phase-contrast microscope with warm stage without carrier. Equipped with objectives of 10 and 40 and connected to a high definition. TV camera.

4) Automatic machine MRS 1 for filling and sealing medium 0.5 ml straws one-by-one, with all accessories.

5) Laiciphos 478 ( dilutor ).

2.2.4. Semen Collection :

Complete automatic dummy cow is required for semen collection.

2.2.5. Field Training Equipments (1) :

In order to attain effective training of the technicians, it is recommended to order :-

1) A mechanical cow provided with both heifer and cow uteri.
2) Three special syringes for searing the cow uterus, 12 screwable searing heads.
3) Battery with charger.
4) 30 sets of rubber boots and aprons.

2.2.6. Transportation :

1) Five side-car motorcycles to be used in Mogadishu area and prospective subcenters of Hargisia and kismayo.
2) Two 4-wheel drive diesel field cars.
3) One extension car, fitted with movie and vidio cameras.
4) One mini-bus for transportation of trainees.

2.2.7. Field Equipments :

1) 20 Inseminator kits.
2) 20 Sets for identification
3) 20 universal inseminating syringes

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(1) For suggested training courses, See supporting activities for the AI programme (2.4).

4) 100,000 universal sheath
5) A radio-television contact set
6) 40 cattle crushes.

## 2.3. RECOMMENDED AI WORK PLAN :

It is recommended that the work plan will be executed into two phases. Phase I will consider the supporting and activation of the existing facilities. Phase II will be more concerned with the expansion of AI activities to new areas.

### 2.3.1. Phase I :

1) Duration : 3 years
2) Project Site : The project will be carried out in three main areas defined as follows.

| Site | Expected cattle population |
|---|---|
| Vicinity of Mogadishu | 20,000 heads |
| Afgoi - Warmahan area | 20,000 heads |
| Afgoi - Shalambot area | 30,000 heads |
| Total | 70,000 heads |

3) Two small AI - subcenters in Hargiesa and Kismayo area should be functioning mainly for extension purposes before phase II.

4) Semen Production Unit ( SPU ) :

The Semen Production Unit at Afgoi will be responsible for processing the required medium straws and storing them along with the semen donated by the FAO.

The estimated number of doses needed for inseminating 70,000 cows/year is 130,000 doses ( 1.8 inseminations/pregnant cow

at a conception rate of 55.6%[1]. As 29,000 doses/year are donated by the FAO, then 101,000 doses will be produced by the SPU yearly.

Under tropical conditions, an average production of 10,000 doses/ bull/ year is expected ; and 30% of the required number of bulls should be kept as spare to avoid unforseen circumstances. Therefore, a total number of 13 bulls is needed for the SPU.

5) Description of the Plan :

a) Mogadishu Area :

Five subcenters,as settled service units,would be responsible for the AI services of the 20,000 heads which comprise the Mogadishu area cattle population. Eight lay inseminators can complete the work . A qualified veterinarian can assist in following up the AI programme and take the responsibility of the sexual health control activities. Three motor-cycles with side cars are essential for the indoor service.

b) Gidka Afgoi - Warmahan Area [2]

Five subcenters can be established at Buulalow, Lamadoonka, Afgoi, Doon Yarrow and Warmahan( Fig. 1). The AI programme is to be organized in order that lay inseminators can travel every working day by a field 4 - wheel drive diesel car to a number of meeting points where insemination crusher are installed. The crushes are located according to the concentration of the animals and farmer's demand . The average distance between crushes is suggested to be five km. Cows for insemination, pregnancy check, or infertility treatment are brought by farmers at the appointed dates. Ten lay inseminators stationed at Afgoi AI Center

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(1) The lower percentage is due to low experience of technicians, lack of extension, and unfavourable environmental conditions including diseases and nutritional deficiencies.

(2) Radius of 50 km.

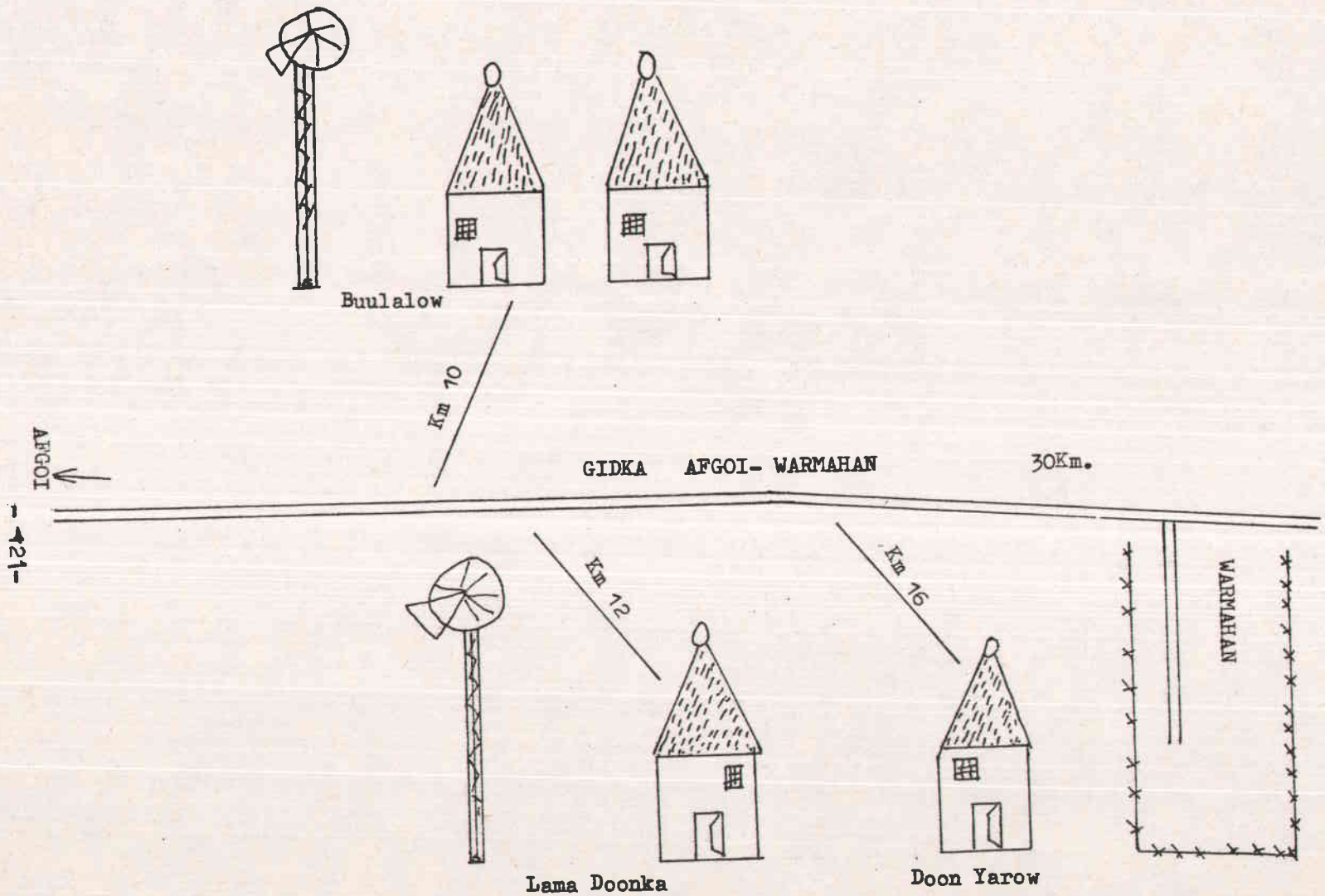


Fig.(1) GIDKA AFGOI - WARMAHAN AREA

can be employed to carry on AI and extension services in this area. A qualified veterinarian responsible for reproductive problems and infertility treatment is essential.

c) Gidka Afgoi - Shalambot Area (1)

Three subcenters with a daily tour of 20 crushes to cover this area including the following districts : Gidka Gianale, Gidka Merka and Gidka Shalambot - Goryolex ( Fig. 2).

One Field 4 - wheel drive diesel car is needed. The working days routine tours can be done by 10 lay- inseminators for AI activity and extension services. A qualified veterinarian will hold the responsibility of the sexual health programme (2).

2.3.2. Phase II :

- Future Subcenters at Hargeisa and Kismayo :

After the recommended plan of phase I becomes well established, two settled AI subcenters for AI and extension activities can be established at Hargiesa and Kismayo. Four Lay inseminators - should be employed - Two motorcycles are sufficient for the job at this phase where more attention should be given to the extension work.

Detailed plan of work can be described for Phase II in view of the results obtained through the application of phase I. Main features of Phase II will be the installation of liquid nitrogen production plants at selected sites in both regions. Frozen - semen supply will be maintained by the SPU at Afgoi after increasing its capacity to meet the needs of the new expansion of AI activities.

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(1) Radius of 50 km.

(2) N. B. During the progress of the project, fixed subcenters can be established in big villages at the areas of operation ( Afgoi - Warmahan and Afgoi-Shalambot).

Fig(2) :- GIDKA AFGOI- SHALAMBOT AREA

## 2.4. SUPPORTING ACTIVITIES TO THE AI PROGRAMME :

### 2.4.1. Training :

A highly qualified and well trained professional and technical staff is essential to ensure success of the AI programme. Therefore, it is highly recommended that veterinary officers of AI subcenters and AI technicians will attend specialized courses of the type organized by the Middle and Near East Regional Animal Health and Production Project ( MINEADEP). Efforts should be made to arrange similar training courses at the Training School of Animal Health at Mogadishu.

The following training courses are proposed in the first year of phase I :-

1) Training course in pregnancy diagnosis and reproductive diseases to be arranged for 21 days. It is recommended that veterinarians will attend the course. Funds could be covered by MINEADEP(1).

2) Training course in straw processing for two Somali Technicians for a period of two months. The course could be held at the AI Section Abu - Ghraib, Iraq. MINEADEP can carry out technical supervision.

3) Training course in maintenance and repair of liquid nitrogen producing 106 plant at the AI Section, Abu - Graib, Iraq, for two Somali technicians for a period of six weeks.

4) Training course in sexual health control and pregnancy diagnosis for 5-7 Somali veterinarians. A highly qualified expert can organize the course for a period of eight weeks, and the course can be held in Somalia.

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(1) For detailed description of the course, see appendix 1.

5) Two in-service training courses in AI for technicians and lay inseminators for a period of 8 weeks , each for ten participants could be held in Afgoi AI Center (1).

2.4.2. Extension :

Extension services will be extended to technicians and farmers to support the AI programme. Simple methods of illustrations can be used to demonstrate how the AI system will be operated. In cases where AI is combined with veterinary service , sexual health and venereal diseases control, treatment of simple cases of infertility, and pregnancy diagnosis can be included in the programme.

2.4.3. Sexual Health Control :

Venereal diseases cause an increased incidence of pathological changes in the genital tract. It is, therefore, strongly recommended that a central laboratory should be established for the diagnosis of the most common venereal diseases. A project for surveying the incidence of such diseases followed by an intensive programme for the control and eventual eradication must be implemented. Intensive scheme for sexual health control including diagnosis and treatment of infertility, early pregnancy diagnosis and handling of post-partum problems should be introduced.

2.4.4. Identification and Recording :

The maintenance of proper records is essential to judge the efficiency of the AI programme. The recording system should provide the necessary data for future modification of the AI services. The system should depend on a reliable method of ear tagging for individual

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(1) For detailed description of the course, See Appendix 2.

identification. A system of recording based on non-return rates can give earlier estimates of actual pregnancy rates than the rectal pulpation of a sample of inseminated animals.

# CHAPTER III

## BREEDING POLICY IN CONNECTION WITH AI

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## BREEDING POLICY IN CONNECTION WITH AI

### 3.1. PRESENT SITUATION :

#### 3.1.1. Production Systems :

The majority of cattle in Somalia are managed under fully-nomadic or semi-nomadic systems where feeding, health control, breeding practices and cattle movements are adapted to the natural characteristics of the country.

A small minority of stock are outside the nomadic systems, and are kept either by settled farmers in mixed farms, or by specialized urban dwellers basically for milk production. However, these systems appear to be rather similar to the nomadic systems with the exception that requirements for the bulk feeding are satisfied from fodder purchased and transported from surrounding areas. In addition, some dairy farms are being established by the government.

#### 3.1.2. Development Programmes :

The first three development plans, 1963 - 1967, 1968 - 1970, and 1971 - 1973 concentrated on the problems of animal health and the organization of livestock marketing rather than production problems. However, it was realized that a comprehensive plan was needed to bring out necessary improvement in cattle producion. The following two development plans of 1974 - 1978 and 1979 - 1981 included the initiation of intensive cattle production systems assisted by an AI programme to introduce and enhance genetic improvement. This involved the establishment of rather large farms, and an AI Center at Afgoi.

### 3.2. BREEDING POLICY UNDER THE CURRENT AI PROGRAMME :

Since 1976, the AI center at Afgoi has been producing fresh semen, mainly from Friesian bulls. During the period 1976 - 1981,

the fresh semen production and utilization were as follows :-

| Year | Fresh semen (cc) | |
|---|---|---|
| | Produced | Utilized |
| 1976 | 250 | 160 |
| 1977 | 4905 | 3957 |
| 1978 | 10262 | 10062 |
| 1979 | 14440 | 12244 |
| 1980 | 17077 | 17000 |
| 1981 | 19009 | 18599 |

After shifting to the frozen semen, a sub project was proposed which included an agreement for frozen semen donation under the FAO - AI and Breeding Development Programme ( AIBDP). The proposed number of doses for the five-year- period 1981/1985 is :-

| Year | No. of Doses ( 000 ) | | | |
|---|---|---|---|---|
| | Friesian | Sahiweil | Semmintal | Total |
| 1981 | 5 | 4 | 1 | 10 |
| 1982 | 7 | 6 | 2 | 15 |
| 1983 | 10 | 9 | 4 | 23 |
| 1984 | 11 | 10 | 5 | 26 |
| 1985 | 12 | 11 | 6 | 29 |

Recently, both Friesian semen donated by FAO and locally processed Friesian Semen are used in insemination to introduce desired genes into the indigenous stock of the neighbouring state farms. Most of the existing F1 females on the state farms and the Municipal Dairy Farms in Mogadishu have been sired by the Friesian bulls of the AI Center at Afgoi. Those females are now mature and have reached the size and age of breeding.

The grading-up scheme can be followed to produce higher grades of crossbred animals if good levels of nutrition and health control are available. However, this should be approached with caution since it is possible to get animals that show lower fertility and higher mortality rates, especially if the crossbreeding programme includes private-holder-owned cattle. Also, there is a risk that if initial crossing is not done on a large enough scale, then problems of inbreeding may be encountered.

## 3.3. RECOMMENDED BREEDING POLICY :

### 3.3.1. Breeding Policy and Environment

The various breeding programmes involving imported animals or semen may include the following plans :-

1. Maintaining the imported cattle in state farms to produce sires and semen for the crossing programme of the national herd.

2. Grading up the indigenous cattle with the exotic breeds in order to obtain crossbred animals.

The best results from such programmes are obtained where environmental conditions are including standard level of management, feed, hygiene and climate and where crossing is done systematically.

Under the systems of production used in Somalia, large differences exist in the environmental conditions to which the animals are exposed. Animals kept in urban areas and state farms receive reasonable protection from environmental hazards while range animals under fully - or semi - nomadic systems cannot be easily protected from these hazards.

In such cases, a stratified crossbreeding scheme may be developed where the breeds involved in the breeding plan and the system of

mating used vary according to ecological conditions, feed resources, management systems and possibilities of disease control.

3.3.2. Breeds Involved in the Breeding Programme :

As soon as the donated semen from FAo (maximum of 29000 doses in 1985) and necessary equipment have arrived and the transportation is secured, AI services should be extended to cover, beside the state farms, the private cattle holders in the Mogadishu area ( a total of 130000 doses is then needed)(1). Subcenters established in the selected areas will help in facilitating the task of daily rounds to fixed AI points that will be carried out by lay inseminators.

From previous experience, and judging by the results obtained from neighbouring countries, available frozen semen from the different breeds involved in the suggested stratified programme can be used as follows :-

1) Friesian semen can be used in state farms and in Mogadishu area where animals can be reasonably protected from local hazards, especially ticks and tick borne diseases,and trypanosomiasis, and where the market demand for both liquid milk and meat exist.

2) In other existing systems, the Sahiwal or Butana are more suitable improvers than a temperate breed. Yet, the Sahiwal bull is known to be a slow breeder, and troubles may arise if the plan depends only on distribution of semen collected from Sahiwal bulls. For slightly improved conditions, semen from a new breed based on cross foundation such as the Australian Milking Zebu can be used for inseminating

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(1) See discussion on Semen production Unit : 2.3.1. (4)

indigenous cows. This breed is based on a Sahiwal by Jersey cross and contains up to 25% of the Zebu blood, and is now available for import. There is good evidence that its yield is higher than that of the pure Sahiwal, but it still needs to be tested under Somali conditions at a limited scale before its semen is widely distributed.

3) For the most severe conditions, consideration should be given to improve suitable indigenous breeds such as the Dwara and the Boran. This can be achieved by distributing semen from tested bulls. The process of improvement can be continued by selection in the herds of the pastoralists in the villages.

3.3.3. Breeding Systems :

Among the various options available in choosing a breeding system, a system that includes both maintaining local breeds and crossbreeding would be recommended. This system has its maximum advantage if the crossing is stratified according to the environmental conditions. The system can be operated as follows :-

1) Straight up-grading indigenous breeds by Friesian blood is performed in State Farms, Municipal Farms, and animals of Mogadishu area. When it is established that under the prevailing environmental conditions ( including climate, disease situation, feeding and management systems) the most productive animals are those containing certain proportions of local blood and imported genes, then a systematic breeding scheme must be chosen which will maintain the desired intermediate type. Systematic cross-breeding schemes need a source of crossing sires from the two breeds involved , the Friesian and the local breed. Indigenous sires should come from an improved local breed

under selection. The semen from both, Friesian and local breeds would be distributed by the AI system.

For situation in which it is desired to stabilized certain percentages of the blood of both breeds, inter-se scheme of mating crossbred females to selected crossbred bulls can be used. This scheme combines the flexibility of systematic crossing programmes, and the simplicity of using one type of sires only.

2) For harsher conditions, where neither the Zebu nor the European breed involved ( i.e. the Friesian) perform satisfactorály, crossing between unrelated tropical breeds would probably give the best results. A system similar to that outlined in the crossing of local breeds with the Friesian can be followed using the Sahiwal, Butana or the Australian Milking Zebu with a local breed. If two tropical improver breeds are available, they can be combined in a three-breed rotational crossing scheme. However, this scheme is a more sophisticated one that needs careful identification of cows.

3) For the most adverse conditions, good indigenous breeds (Dwara and Boran) must be retained and a selection programme to improve them is carried out through producing superior stock for distribution and selection of progeny tested Dwara and Boran bulls. Semen from these bulls would be frozen and distributed for inseminating the stock of the postoralists and in the villages. The presence of AI will make available large numbers of cows which can be included in the selection programme. Selection among indigenous breeds is also an integrated part of some systematic breeding programmes where exotic and indigenous breeds are used. Institutional farms and facilities have an important role in producing progeny tested bulls and in the continuous distribution of breeding heifers to cooperating farms.

Selection for both milk and beef is also possible . The dairy progeny test can be preceeded by the performance test and a fraction of the young bulls is culled. The remaining bulls are then progeny tested for milk yield by the usual procedure.

## 3.4. SUPPORTING ACTIVITIES TO THE BREEDING POLICY :

### 3.4.1. Cattle Identification and Recording[1] :

All breeding schemes need careful identification of animals so that the right type of bull can be used on the right type of cow. A system of identification of calves immediately after birth is necessary to determine their breed and grade.

A recording system should also be established. The system would vary in amount of complexity according to the following :-

1) Ecological zone in which livestock are kept.

2) Management system ( nomadic, settled, small holder or intensive).

3) The breeding system used in the improvement programme.

4) Technical staff available for the job.

A simple system in which only sample of the farms and animals are represented can be developed in the early stages of the programme to provide baseline data on survival, production and reproduction of cattle. The second step is to extend the recording system to include a limited number of economically important traits that can be easily

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(1) See also, Identification and recording, item 2, 4.4, (supporting activities to the AI Programme).

measured with a reasonable degree of accuracy. The value of the information obtained from the privately owned herds resides in that these information are collected from large sized herds which live under environmental stress. Certainly, written records used in state farms can be considered as a good source of information on more traits that need skill and equipments for measurement ( e.g. milk constituents, growth rate and carcass characteristics).

3.4.2. Training :

The implimentation and operation of the various aspects of the breeding programme are highly dependent on the personnel involved. The proposed training programme will include the following courses in the first year of phase I[(1)].

1) Training course in livestock recording and data analysis . It is suggested that two livestock specialists will attend this course abroad for one year.

2) Training course in animal breeding including progeny testing. Two livestock specialists are recommended to attend this course abroad for six months.

3) Training course for technicians in cattle identification and simple on-farm recording. This course can be held at the Institute for Animal Science or at the Livestock and Range School at Afgoi. The course will also include in-service training. It is suggested that the course will last for two months.

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(1) See also, Training, item 2.4.1(supporting activities to the AI Programme).

3.4.3. Extension Service :

The transfer of scientific knowledge to farmers who use improved techniques of livestock production should be given high priority. The extension programme will consist of demonstrations and advice in accordance with the livestock improvement programme. Facets to be covered may include fodder production, pasture management, proper livestock management and feeding systems, cattle identification and typing of animals, handling and marketing of livestock and livestock products[1].

3.4.4. Technical Assistance :

The technical aid programme is proposed to support the breeding policy as well as the training programme . Foreign experts and expatriates are needed until efficient local staff is available.

Phase I :

1) A livestock husbandry expert in cattle identification and recording is required to organize and supervise these operations, and help in the training courses for a period of one year.

2) A cattle bredding consultant to put down the overall plan of the cross breeding and selection programmes including the progeny testing of bulls. Systems of breeding should be defined in full detail before the programme is executed. The consultant is also needed to supervise the early stages of execution. The suggested period of consultancy is two years.

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(1) See also, Extension, item 2.4.2. ( Supporting activities in the AI Programme).

3) An expatriate in cattle identification to help in field work and in the in-service training for a period of one year.

**Phase II** :

4) An expert in data analysis and interpretation. This expert is needed after a reasonable amount of data has been compiled. He should acquire knowledge in both animal breeding and statistical analysis of field data. Proposed period of consultancy is two years.

## APPENDIX 1

## TRAINING COURSE IN PREGNANCY DIAGNOSIS AND REPRODUCTIVE DISEASES

**Level** : Veterinarians.

**Duration** : One month

**No. of Participants** : 7 - 10

**Theoretical Programme** :

Physiology of conception.

Reproductive diseases.

- Venereal diseases and diseases of abortion.
- Hormonal thereby and infertility treatment.
- Sexual health control recording.

**Pratical** :

- Pregnancy diagnosis.
- Infertility diagnosis and treatment in field.
- Laboratory diagnosis of venereal diseases and diseases of abortion.
- Eradication of brucellosis.
- Sexual health control schemes in herds and farms.

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## APPENDIX 2

## TRAINING COURSE IN A. I. (TECHNICIANS AND LAY INSEMINATORS)

**Level** : Middle - Vet. Technical and/or Agric. Technical Schools.

**Duration** : 6- 8 weeks.

**No. of Participants** : 10 - 15.

**Theoretical Programme** :

- Anatomy of genetalia.
- Physiology of Reproduction.
- Principals of A. I. ( Projects and management )
- A. I. records.

**Practical Training** :

- Semen collection and bull management.
- Semen evaluation, dilution and processing.
- Field insemination.
- Pregnancy diagnosis.
- Liquid nitrogen production and handling.

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ARABIC ABSTRACT

## مقترحـــات

## لتنظيم خدمات التلقيح الصناعى ورسم سياسة مرتبطة به لتحسين الماشية فى جمهورية الصومال الديمقراطية

أنشئ مركز التلقيح الصناعى فى أفجوى - على مسافة حوالى ٣٠ كيلو مترا من مقديشو - فى عام ١٩٧٦ . وقد ظل يعمل فى انتاج السائل المنوى الطازج الذى يستعمل فى تلقيح ابقار المزارع الحكومية المجاورة بصفة اساسية منذ انشائه وفى الفترة الاخيرة تلقى المركز مساعدات ومعونات فنية تمثلت فى الاجهزة المعملية والسيارات والسائل المنوى المجمد وبعض الفنيين . وقد أدى ذلك ، بالاضافة الى تشغيل وحدة انتاج النتروجين السائل ، الى تحويل انتاج المركز الى السائل المنوى المجمد ، مما يمكنه من زيادة حجم خدماته بتغطيتها لمناطق أبعد ولأعداد أكبر من الحيوانات .

ولكى يؤدى مركز التلقيح الصناعى دورا فعالا فى تحسين الماشية فان التوسع فى الخدمات التى يؤديها يجب ان يرتبط بسياسة شاملة للتربية تتلاءم مع الظروف البيئية المتباينة ونظم الانتاج المختلفة التى تربى تحتها الحيوانات فى الصومال .

وقد أوفدت المنظمة العربية للتنمية الزراعية فريقا من الخبراء فى شهر سبتمبر أيلول ١٩٨٢ بغرض دعم وتنظيم خدمات التلقيح الصناعى الميدانية ، ورسم خطة عمل لنشر العوامل الوراثية المتميزة من خلال التلقيح الصناعى ، واقتراح البرامج المساعدة كالتدريب والارشاد والتسجيل ، بالاضافة الى أجراء بعض الاصلاحات واعمال الصيانة التى كانت تعوق تشغيل بعض الاجهزة والمعدات ، واعداد قائمة بقطع الغيار اللازمة لانتظام التشغيل .

وفيما يلى موجزا لأهم ما جاء بتقرير الدراسة من توصيات:

١- تحسين الامكانيات الحالية للتلقيح الصناعى :

١-١ وحدة انتاج النتروجين السائل والمولدات الكهربائية :

نظرا لعدم وجود مصدر آخر للنتروجين السائل سوى ما تنتجه الوحدة الحالية ، فانه ينصح باضافة وحدة أخرى فى نفس الموقع لتلافى أية أعطال مفاجئة ولتغطية الكميات الاضافية المطلوبة للتوسع فى اعمال التلقيح الصناعى . وتتصل الوحدتان معا بخزان رأسى سعته ١٨٠٠ لتر .

وقد تم اقتراح بعض التعديلات فى ضبط المولد الكهربائى الاحتياطى

وأعدت قائمة بقطاع الغيار اللازمة لانتظام انتاج النتروجين السائل وامداد المعمل بالتيار الكهربائى دون انقطاع .

١-٢ المهمات المعملية والمعظية والتدريبية :

اعدت قائمة بالادوات والمهمات المعملية اللازمة لتقييم السائل المنوى وتعبئته ، كما نصح بتوفير المهمات الخاصة بالتدريب الميدانى على اعمال التلقيح الصناعى وأهمها البقرة الميكانيكية ، وتوفير أطقم الادوات التى تستعمل فى الاعمال الميدانية للتلقيح الصناعى .

١-٣ جمع ونقل السائل المنوى :

نصح بشراء نموذج لبقرة للمساعدة فى عمليات جمع السائل المنوى ، كما ان دعم خدمات التلقيح الصناعى الميدانية والارشادية يستدعى وجود خمس موتوسيكلات بعربات جانبية، سيارتين للعمل فى المناطق الوعرة ، سيارة مجهزة بالوسائل الارشادية ، سيارة نقل ركاب صغيرة .

٢ ) الخطة المقترحة للعمل الميدانى :

اقترحت خطة عمل من مرحلتين ، تشمل المرحلة الاولى تدعيم وزيادة فاعلية الانشطة الحالية لمركز التلقيح الصناعى الحالى فى أفجوى . ويمتد نشاط المركز فى المرحلة الثانية ليشمل المناطق البعيدة فى هرجيسا وكيسمايو .

٢-١ المرحلة الاولى ( ثلاث سنوات)

يغطى نشاط المركز فى هذه المرحلة ثلاث مناطق مختارة هى : مقديشو طريق أفجوى - وارمحن ، وطريق أفجوى شالامبوت . وتضم انشطة المركز أنشاء شبكة من المراكز الفرعية لنشر خدمات التلقيح الصناعى فى المناطق المختارة وانتاج ١٠١ ألف قصبة متوسطة من السائل تكفى بالاضافة الى الكمية التى تم توفيرها عن طريق منظمة الاغذية والزراعة للامم المتحدة والبالغ عددها ٢٩ ألف قصبة لتغطية الكمية الاجمالية ( ١٣٠ ألف قصبة ) اللازمة للابقار الموجودة بمناطق العمل المختارة وهى ٧٠ ألف رأس تقريبا .

٢-٢ المرحلة الثانية :

ينشأ مركزان تلقيح صناعى فرعيين جديدين فى هرجيسا ( شمالا ) وكيسمايو (جنوبا ) . ويتم كل منهما معملا لانتاج النتروجين السائل . وسيتم امداد المركزين الفرعيين بالسائل المنوى المجمد من المركز الرئيسى فى افجوى بعد زيادة طاقته الانتاجية .

## ٣- الانشطة المساندة لبرنامج التلقيح الصناعي :

### ٣-١ التدريب :

يضم برنامج التدريب المقترح ثلاثة مناهج يضم كل منهم اثنين من الفنيين الصوماليين الذين يتم تدريبهما في الخارج . والمناهج الثلاثة هي :

١/ تشخيص الحمل والامراض التناسلية ( ثلاثة اسابيع )

٢/ تصنيع السائل المنوي ( ثمانية اسابيع )

٣/ صيانة واصلاح معدل انتاج النتروجين السائل ( ستة اسابيع )

ويمكن ان يقوم المشروع الاقليمي للانتاج والصحة الحيوانية في الشرق الاوسط والادنى التابع للامم المتحدة تنظيم هذه الدورات .

ويضم البرنامج أيضا منهجين تدريبيين أثناء الخدمة ، الاول على الوقاية الصحية ( ثمانية اسابيع لعدد ٥ - ٧ أطباء بيطريين ) ، والثاني على عمليات التلقيح الصناعي لمستوى الملقحين ( ثمانية اسابيع ) .

### ٣-٢ الارشاد :

تغطي خدمات الارشاد الفنيين والمزارعين لدعم برنامج التلقيح الصناعي وبيان مزاياه ، ويمكن ان تحتوي البرامج الارشادية على بعض الخدمات الصحية البيطرية .

### ٣-٣ الوقاية الصحية التناسلية :

ينصح بانشاء معمل مركزي لتشخيص الامراض التناسلية . كما انه من الضروري أجراء مسح شامل لأهم هذه الامراض ومدى انتشارها . ويتبع ذلك برنامج للسيطرة على هذه الامراض والتخلص من أهمها وأكثرها شيوعا .

كما أنه ينصح بالبدء في مخطط لتشخيص وعلاج امراض العقم ، والتشخيص المبكر للحمل ومعاملة الحيوانات عقب الولادة .

### ٣-٤ تمييز الحيوانات والتسجيل لاغراض التلقيح الصناعي :

ينصح باتباع احدى طرق الترقيم في الاذن والتي يمكن الاعتماد عليها في تمييز الحيوانات . كما انه من المفيد نظام تسجيل يعتمد اساسا على معدلات عدم عودة الشبق للابقار الملقحة لاعطاء مؤشرات مبكرة لمعدلات الحمل الفعلية

## ٤- خطة التربية المقترحة لتحسين الماشية المحلية :

### ٤-١ الاطار العام

تتباين الظروف البيئية ونظام الانتاج التي تربى تحتها الحيوانات في الصومال

ومن ثم ،فان نظام تربية تصنيفي يعتمد على استعمال سلالات مختلفة ونظم تربية متعددة تتلائم مع المناخ ،ومصادر الغذاء ،ونظام الانتاج والوقاية الصحية في كل منطقة .

٤-٢ السلالات ونظم التربية :

٤-٢-١ في مزارع الدولة ، ولدى المربين في منطقة مقديشو حيث تسود ظروف ملائمة نسبيا ، يجرى تدريج الماشية المحلية بالفريزيان . ويمكن بعد الوصول الى درجة معينة من الدم الاجنبي يتقرر بناءعلى نتائج التدريج - تثبيتها ، اجراء التزاوج بين الذكور والاناث الخليطة تبعا لمقاييس انتخابية محددة .

٤-٢-٢ في الظروف الاقل ملائمة ،يفضل استعمال الساهيوال أو ماشية اللبن الزيبو الاسترالية بدلا من الفريزيان كسلالة أبوية لتحسين السلالات المحلية .

٤-٢-٣ في الظروف الشاقة ،ينصح باجراء برنامج انتخاب في السلالات المحلية الجيدة ( الدوارا والبوران ) . ويشمل البرنامج انتاج الطلائق المختبرة بالنسل واستعمالها في التلقيح وتوزيع الاناث المحسنة تباعا على المزارعين . ويناسب هذا البرنامج نظم الانتاج المتبعة في تلك المناطق لسهولة تطبيقه حيث يتم التعامل مع سلالة واحدة فقط .

٥- الانشطة المساندة لبرنامج التربية :

٥-١ تمييز الحيوانات والتسجيل لاغراض التربية :

يتم ترقيم الحيوانات مباشرة بعد ولادتها باتباع طريقة تتيح معرفة كل حيوان على حدة والسلالة التي ينتمي اليها ودرجة الخلط فيه .

كما تتباين نظم التسجيل . فيتبع نظام سهل يعتمد على عينات من الحيوانات والقطعان لاعداء بيانات مبدئية عن قدرة الحيوانات على البقاء والتكاثر والانتاج تحت الظروف المحلية . وكخطوة تالية ، يتدرج النظام بحيث يشمل عددا من الصفات ذات الاهمية الاقتصادية والتي يمكن قياسها بسهولة وبدرجة معقولة من الدقة . أما في المزارع الكبيرة ، وخاصة مزارع الدولة ، حيث تدون المعلومات وتحفظ عادة في سجلات ،فان هذه السجلات تعتبر مصدرا ثمينا للمعلومات التي تعتمد على خبرة خاصة واجهزة معينة في قياسها .

٥-٢ التدريب :

ينصح بايفاد اثنين من المتخصصين في الانتاج الحيواني لدراسة نظم التسجيل وتحليل البيانات لمدة عام ،واثنين لدراسة تربية الحيوان بما فيها

طرق اختبار النسل للثيران لمدة ستة شهور .

ومن المفيد أيضا اقامة دورات تدريبية أثناء العمل مدة كل منها ثمانية اسابيع للتدريب على طرق ترقيم الحيوانات وتسجيل انتاجها تحت الظروف المزرعية .

٥-٣ الارشاد :

يمكن تجهيز برنامج ارشادى يوضح عمليات رعاية وتربية الحيوان ويشمل انتاج الاعلاف وادارة المراعى والطرق الصحية لرعاية الماشية ونظم الانتاج ، وترقيم الحيوانات وتسجيل انتاجها ،وتداول وتسويق المنتجات الحيوانية .

٥-٤ المعونة الفنية :

يمكن تنظيم برنامج من مرحلتين للمعونة الفنية . ففى المرحلة الاولى ،يكلف خبير فى طرق تمييز الحيوانات وتسجيل الانتاج ( لمدة عام ) وخبير فى تربية الحيوان ( لمدة عامين ) ، وفنى فى طرق تمييز الحيوانات للمساعدة فى اعداد خطط التربية والاشراف على تنفيذها لحين توفر الكوادر المحلية الكفوءة . وفى المرحلة الثانية ، حيث تكون كمية كافية من البيانات والمعلومات قد تم تجميعها ،فان الحاجة تدعو الى وجود خبير فى التحليل الاحصائى ، ذو خبرة فى تحليل بيانات الانتاج الحيوانى وايضاحها ، على ان تمتد مهمته لفترة عامين .

٦- الدعم المالى للمشروع المقترح :

يحتاج المشروع المقترح فى هذه الدراسة الى دعم مالى خارجى من الهيئات الدولية والاجنبية والعربية ذات الصلة بالتنمية الزراعية والانتاج الحيوانى . ويوصى فريق خبراء الدراسة الحالية بالمجالات التالية كميادين يمكن ان تساهم المنظمة العربية للتنمية الزراعية فى تمويلها جزئيا او كليا خاصة المهمات الحقلية اللازمة للتنقيح الصناعى من النواحى العملية والارشادية والتدريبية ، وسائل النقل برامج التدريب والمعونة الفنية .

طبع بمطبعة المنظمة العربية للتنمية الزراعية
الخرطـــــوم