VETERINARY DEVELOPMENT PROGRAMME - DHOFAR

Review of the Situation at Maroh 1972

Veterinary Officer
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Director of Development - Dhofar
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Sultanate of Oman

15 March 1972

REVIEW OF VETERINARY DEVELOPMENT PROGRAMME

1. Enclosed please find copy of the above review describing the situation at 1st March 1972.

First class, both as a guide to DDD as to what they need to do, but also as an historical document: of clear value* to posterity.

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Veterinary Development Programme Dhofar - March 1972

DADVRS Visit to Nepal - March 1977

1. The above reports were written many years ago and the situations in the locations described may well have changed beyond recognition. However, the issues addressed in the reports still exist in many parts of the world and certainly, as the 1995 Institute of Hydrology paper indicates, the problems in Nepal remain, perhaps in larger measure than before.

2. It is perhaps worth reiterating the fundamental priorities in any third world livestock development programme which are:

   Water
   Food
   Shelter

   These factors apply equally in an advanced country which has been devasted by war or natural catastrophe. Even so, in almost all agricultural development or rehabilitation schemes which have been undertaken in modern times, the same mistake has been repeated time after time. This has been to attempt to institute a sophisticated agricultural system based on Western technology in a situation where the infrastructure and available resources were incapable of sustaining it.

3. To quote specific examples, the use of European bulls in Dhofar to upgrade cattle where the indigenous animals were particularly undersized, underfed or even starving to death was pointless. Payne in "Cattle Production in the Tropics" Vol 1 describes how this policy was adopted in many parts of the Middle and Far East, particularly India, with generally very disappointing results.

2/...

4. In Nepal, attempts were made at various times to introduce TB testing to the Gurkha Resettlement farms. The aim of TB testing is to eradicate reactors from the herds and, eventually, the whole locality. It is a policy which can only be undertaken in a very advanced economy. It only got fully underway in the UK in the late 1950s and at enormous public expense. In Nepal, TB is endemic and to slaughter any cow is a particularly serious criminal offence. If TB is thought to be present in milk in such a situation, the solution is not TB testing, but boiling.

5. Certainly today there is a greater appreciation of social, economic and environmental factors affecting development schemes. As a consequence, they are generally planned with local circumstances and needs very much in mind. There are a number of development agencies carrying out projects where such low technology is the central feature. Perhaps one of the best examples in this respect is FARM Africa.* It is recommended that when agricultural development programmes are being considered, contact is made with FARM, who will willingly provide advice and introductions based on their wide experience of projects all over Africa. (One of the senior council members of FARM Africa is General Sir Peter de la Billiere).

6. In summary, circumstances change but many of the problems remain the same. Perhaps the most important initial activity when undertaking a development programme is to carry out a thorough survey as soon as possible and to record every scrap of information. Careful reporting will ensure continuity when the next team takes over. Instead of reinventing the wheel, a foundation will have been laid upon which successive layers of progress may then be built.

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1. Introduction

Prior to mid-1970 the economy of Dhofar was moribund. The level of agricultural production in this former food exporting Province was barely sufficient to maintain its depleted population at subsistence level.

This is a Province of great agricultural potential with the natural advantages of favourable climate, moderately good soil and adequate sources of water. There is scope for a considerable increase in farm output for both home consumption and export. This view is supported by the reports of Jack, Durran and Johnson.

In the following sections the aim of the programme will be given, achievements since August 1970 will be reviewed and suggestions made for future approaches to development.

2. The Aim

a) Threefold Aim

The aims of the veterinary officers[#] of the British Army Training Team in the "Hearts and Minds" campaign have been,

i. To assess the livestock situation
ii. To establish the framework of a veterinary service.
iii. To point the way to the future improvement of livestock husbandry and production thereby helping to ensure the development of a healthy and balanced national economy.

b) The basic need

What is required in Dhofar is an improvement in basic methods of husbandry. The aim has been to show farmers how attention to simple practical matters can do much to improve their way of life.

Very little capital expenditure or even increase in effort are required to bring about these improvements. What is required is a change in methods and attitudes and this must be repeated again and again to have any effect.

c) What the aim has not been

The aim has not been to introduce sophisticated Western ideas on veterinary medicine or livestock production. The people are not yet ready for them, nor will they be, for many years. In any case it is debatable whether we would be doing the Dhofaris a favour by inflicting too much advanced Western technology on them at this stage of their development.

Veterinary officers attached to B.A.T.T. for the "Hearts and Minds" Campaign, Dhofar.

1. September 1970 - March 1971
   Major A.W. Horne, B.V.Sc., M.R.C.V.S., R.A.V.C.
2. March 1971 - September 1971
   Major B.J. Thompson, B.Vet.Med., M.R.C.V.S., R.A.V.C.
3. August 1971 - March 1972
   [illegible] N.D.A., N.D.D., M.R.C.V.S., R.A.V.C.

3. Assessment of the Livestock Situation

a) V.O.s Reports

All three R.A.V.C. officers involved in the project have from time to time submitted reports on the livestock situation both in the Plain and on the Jebel. In this they have been most generously assisted by Mr. Abbus Sitar Basrah, M.Sc., who has himself contributed so much to the agricultural development of Dhofar.

Much useful background information was obtained from the reports of Jack, Durran and Johnson.

b) Sources of assistance

The assistance of the following is gratefully acknowledged.

British Army Training Team
Director and Department of Development, Dhofar
Sultan's Armed Forces
Sultan of Oman's Air Force
Defence Department, Oman
Department of the Environment
Taylor Woodrow (International) Limited
Royal Air Force, Salalah
R.A.V.C. School, Aldershot

and lastly, but by no means least, the

Royal Army Medical Corps and
Royal Air Force Medical Branch.

4. The Provincial Veterinary Service

a) The Livestock Centre

A veterinary service has been established in the Province; this is based on the Livestock Centre at Bir bint Ahmed in Salalah. Animals are brought to the centre for treatment or where they cannot be brought in, visited at the owner's premises.

Treatments are carried out daily except on Jumma when only emergency cases are dealt with.

b) Veterinary Assistants

Several assistants have been trained as veterinary dressers. They assist the veterinary officer in Salalah, or in other cases work at outstations which are regularly visited by the veterinary officer.

c) Allotment of Priorities

i. The animal disease picture in Dhofar has as yet received very little detailed study. A great deal of work requires to be done on the epidemiology of disease. The fundamental need in this early stage of the development programme has been to teach farmers how to make simple improvements in their methods of livestock husbandry and to establish a framework on which later investigation work may be carried out.

ii. It is almost certain that such diseases as bovine tuberculosis and brucella are widespread in the Province and doubtless many other diseases are also prevalent. What is quite obvious is that malnutrition, poor hygiene and sheer bad husbandry are the norm. These fundamental defects must be overcome before preventative medicine and veterinary treatment can start to have any real or lasting effect.

d) Two important factors

i. Training of the assistants has been directed towards the improvement of animal husbandry. They have been shown that the provision of a good diet, adequate water and better housing, will go a long way towards raising the level of livestock production.

ii. The Agricultural Department in raising the level of crop production and in introducing new varieties of crops, is doing much to help overcome the problem of both human and animal malnutrition.

Under Mr. Basrah the Department has given continual valuable assistance and advice to the veterinary officers throughout the whole programme.

5. The Educational Programme

This is almost certainly the most important single factor in raising the level of animal husbandry. It has been approached from several angles.

a) Direct Approach

The example and encouragement of the veterinary officers and their assistants have gone some way to spread the knowledge of better husbandry methods. It is necessary to continually emphasise the importance of hygiene and good diet on every possible occasion. Each owner receives simple instruction in these subjects when his animals are given treatment.

The majority of farmers seem convinced that injections alone will bring about dramatic results, failing to realise that much more will often be achieved by simple improvements in their methods of stock keeping.

b) Schools Liaison

It is a generally accepted fact that one of the best methods of spreading propaganda is by indoctrinating schoolchildren. This approach has been used here. Pamphlets on better farming methods, poultry keeping and coconut growing have been printed by PSYOPS and issued in bulk to schools. Copies have been prepared in Arabic and English and are being used for the teaching of English. Textbooks in English are in great demand in Dhofar but are in short supply. The pamphlets therefore have the dual effect of helping with language teaching and spreading ideas on better farming methods, both among the children and indirectly, one hopes, among their parents.

c) Broadcasting

Radio Salalah, through PSYOPS has broadcast talks on better methods of agriculture and drawn the attention of farmers to the fact that a free agricultural and veterinary service now exists in the Province. The opening of the veterinary dispensaries has been publicised, on both the radio and in the weekly newsheet and farmers have been advised to consult the veterinary service when they have livestock problems. The fact that the service is free of charge has been emphasised.

d) Distribution of Pamphlets

Arabic copies of pamphlets on farming have been distributed to farmers by the veterinary officer and his assistants. Any printed matter is eagerly accepted in Dhofar, by both children and adults. Although illiteracy is widespread, those who are literate, read the pamphlets aloud to their neighbours thus helping to spread new ideas.

e) Farm visits

Visits to Government farms at Bir bint Ahmed and Robat have been arranged for schoolchildren and farmers, to demonstrate the effects of better farming methods.

f) Young Farmers' Club

It is suggested that a Young Farmers' Club be started in Salalah with a programme of lectures, films and demonstrations on agricultural topics. Cooper, McDougall and Robertson will be prepared to supply films with Arabic sound track, dealing with farming subjects.

g) Summary

The educational programme should spread new ideas by:-

i. Direct instruction by the VO and his assistants.
ii. Propaganda in the schools.
iii. Radio broadcasts.
iv. Distribution of pamphlets.
v. Newspaper articles.
vi. Farm visits.
vii. Young Farmers' Clubs.

The same basic principles must be continually repeated at frequent intervals. If 25% of shots hit the target, much will be achieved.

6. The Veterinary Hospital

a) Function

A well equipped veterinary hospital has been planned at the Livestock Centre at Bir bint Ahmed in Salalah and construction has now commenced.

Its aim is:-

i. To act as a clinical centre for the treatment of sick animals.
ii. To act as a centre of animal health education both for trainee extension workers and the general public, particularly schoolchildren.

iii. To act as an investigation centre and for the carrying out of post mortems and the examination of milk and other foodstuffs.

iv. Laboratory examination and the study of epidemiology should be used to build up a picture of the animal disease situation in the Province.

v. The importance of studying the zoonoses should be borne in mind and a close liaison should be maintained with the medical authorities at Salalah Hospital, when working in this field.

b) Information and Records

A filing system has been established for use at the hospital when it is completed. This should be maintained by the clerk and closely supervised by the veterinary officer.

The present veterinary officer has prepared a technical report for the Director of Development at the end of each month. The report has taken the form of:-

i. Diary of daily occurences.

ii. Reports on specific subjects, e.g. The Meat Trade, Survey reports on particular areas, projects etc.

iii. Summary of the month's work and future needs and intentions. (A copy of this has been forwarded to B.A.T.T. each month).

iv. Annexures containing any letters, documents or pamphlets of interest.

The object of these reports has been to permanently record as many facts as possible for future reference.

While it is important to minimise paper work, so little is known of the animal disease profile of this part of Arabia, that it is probably worth while recording even the most simple observations and occurences for future use.

From time to time the civil veterinary officer may be called upon to assist the Sultan's Armed Forces with animal transport problems. For this reason notes on the subject have been included in veterinary reports.

c) Equipment and Supplies

A wide range of drugs and instruments are now held at the hospital. A small but comprehensive reference library has been established. The latter should be kept up to date by purchase of the Veterinary Record and each year, of the Veterinary Annual, and other relevant literature and textbooks. Funds for this purpose have been allotted in the annual veterinary estimates.

In the early stages of the programme drugs and equipment were obtained through B.A.T.T. HQ at Hereford and the R.A.V.C. School, Aldershot. Channels of supply have now been established as follows:-

i. Drugs and Pesticides

Veterinary Drug Company (York) Ltd.,
14-16 Stanhope Road,
Finchley, London, N.12.

Cooper, McDougall and Robertson Ltd.,
Berkhampstead, Herts., U.K.

ii. Instruments

Arnolds Veterinary Products Ltd.,
1 Cremyll Road, Richfield Avenue,
Reading U.K.

iii. Reference Books

Bailliere, Tindall
7-8 Henrietta Street,
London, W.C.2.

The Veterinary Drug Company (York) Ltd. will supply current copies of the Index of Veterinary Specialities, free on request.

It has been found convenient to restrict the number of suppliers to as few as possible, in order to simplify administration and where possible to make purchases in bulk.

7. The Veterinary Dispensaries

a) Locations

Veterinary dispensaries have been established at Dheriz, Awgud and Tarqah. Further dispensaries are to be opened at Murbat and Sudh. They consist of lock-up rooms which are stocked with a supply of basic drugs, instruments and educational pamphlets.

b) Function

An assistant is stationed in each of these locations using the dispensary as a base. He divides his effort between carrying out simple treatments and in encouraging the local farmers to use better methods.

c) Supervision

The work of the assistants is to some extent supervised by the veterinary officer who makes frequent and unannounced visits to the locations. By so doing he is able to gain information on the general livestock situation as well as check on the work of the assistants.

The latter however obviously enjoy a fair measure of independence in their work and because of this, the importance of training them correctly and thoroughly in the basic techniques cannot be overstressed.

d) Need for further extensions

The dispensaries in Tarqah, Murbat and Sudh will serve the lower reaches of the Jebel, which has as yet been barely touched by the programme. The establishment of further outstations should also be considered wherever practicable. As well as helping to improve the level of husbandry they have a definitie "hearts and minds" effect on the local populations.

8. The Dairy Farm and the Dairy Industry

a) The Aims

i. Milk production for sale

Construction of the new dairy farm has been commenced at Bir bint Ahmed. Its primary object is to provide good quality, clean milk for sale to the general public. This process should be put onto a commercial basis as soon as possible. Certainly the aim should be to sell milk at a price which will cover the cost of production. It must be assumed that the initial capital cost of establishing the dairy will be written off by the Government.

Should a meat industry be established it may be necessary to hold milking animals for an interval before slaughter. The possibility of producing milk from such animals should then be considered (See Annex 'C' 6 (b)).

ii. Genetic Pool

Assuming that a breeding herd rather than a "flying herd" is to be established, the dairy farm will act as a reservoir for good genetic factors. Not all the progeny will be required as replacement animals. Surplus male animals if not fattened as steers should be sold for breeding. Surplus femals should be sold for rearing for breeding and milk production and by so doing help to raise the level of output of private herds.

The establishment of a "flying herd" might at first glance seem a more attractive policy, certainly it would present fewer initial problems. However such a policy is not to be recommended because it would produce no long term benefits and the problem of disease control would be much greater.

iii. Educational Value

The dairy farm should be used to educate both veterinary assistants and the public in better methods of hygienic milk production, better feeding and husbandry.

Profitable milk production should be demonstrated as simply as possible. It will be necessary to keep milk yield and breeding records and to feed stock according to output. Such records should be presented in a simple manner, literate people will very quickly grasp the principles involved and in some cases it is to be hoped will apply them to their own animals. Those who do so will quite quickly see a rise in output and income.

As has already been stated, methods of milk production should be kept as simple and near to traditional as possible. Hand milking only should be practised. It might be possible to installmilking machines in the not too distant future, but to do so would defeat the whole educational aim. Milking machines should not be installed for at least five years, if then.

b) Present milking stock

A group of milking cows and followers are at present held at Bir bint Ahmed. Some are of very indifferent quality. After testing for tuberculosis, brucella and theilliria any reactors should be culled. Those others of poor quality should not be regarded as foundation stock, but culled as soon as is reasonably possible.

c) Future stocking policy

i. Foundation Cows

The aim should be to obtain some good quality foundation cows. They will of necessity be selected phenotypically. For this purpose Jebali cattle are the answer. All those cattle seen on the Jebel were far superior both constitutionally and in milk potential to Plain cattle. Ten maiden heifers of Jebali origin were in fact purchased for breeding in November 1971 (See Annex 'F').

ii. Nutrition

These animals will have been used to a low plane of nutrition and for this reason should receive coarse fodder only, initially. Bullrush x Napier Grass and dry Sorghum would be suitable material. As they adapt to better conditions the plane of nutrition should gradually be raised. A high plane of nutrition should be avoided and "steaming up" in particular should not be practised, however tempting. Artifically high milk yields are not required and would not be realistic from the commercial point of view.

iii. Breeding Policy

The next matter to consider is breeding policy. The purchase of the three Friesian bulls had an excellent publicity value as part of the "hearts and minds" campaign, but from every other point of view it must now be admitted that it was a mistake. Durran's report should be consulted for further views on this subject.

Without wishing to labour the point their advantages and disadvantages must be carefully examined.

The advantage of crossbreeding local cattle with the bulls is that hybrid vigour may be obtained in the first generation, with a consequent increase in milk yield.

The disadvantages are, that hybrid vigour will soon be lost, the bulls are far too heavy to serve the smaller local cattle. Dystokia must be anticipated at parturition, this could lead to the loss of the cow and calf and would anyway greatly depress milk yield for that lactation. The resistance to disease of the progeny is likely to be impaired.

It we intend to maintain a closed herd, as we should, it might be a good policy to use Jebali bulls on half the females and the Friesians on the other half. The results could then be compared. Jebali cows would be much more likely to cope with these bulls, and this could te regarded as an acceptable experiment.

Unfortunately this solution poses a serious dilemma. If the Friesian bulls are to be used in a closed herd then they cannot possibly be used to serve local outside cattle as well. If they were so used, there would be a serious possibility of introducing tuberculosis, brucella, theilliria and even trichomoniasis into our own herd.

The alternative would be to use the Friesian bulls exclusively for crossing with outside cattle, although the disadvantages of this have been indicated above. Jebali bulls could be used exclusively for our own cows and the herd could be gradually improved. The obvious way out of this dilemma would be to use AI but this cannot be considered in the present situation.

My own advice would be to use the Friesian bulls as closed herd animals and phase them out as quickly and discretly as possible and then concentrate on pure Jebali stock.

In future, livestock importations of any species should only be undertaken after the most careful consideration of all the factors and consultation with the Middle Eastern Agricultural Development Bureau in Beirut.

d) Dairy Products

Initially liquid milk must be the primary product of the dairy herd with beef as a secondary product. However as soon as possible the production of the following should be considered,

butter,
ghee,
cream,
dried milk
cheese.

These foodstuffs will have a profound effect in raising the poor standard of diet of the Plain population. If in a few years time production can be sufficiently increased to yield a surplus, then the manufacture of these commodities for export should be undertaken.

The section on dairying has been presented in some detail because it is considered that a sound dairy industry is the most important factor in improving the agricultural economy of Dhofar.

9. Poultry Development

a) The Present Situation in Dhofar

Poultry in the Province are generally of very poor quality. They are small in size and produce very few eggs and little meat.

They are regarded as creatures that happen to inhabit the farmyard and as such are expected to fend for themselves. They are seldom provided with food and water and are badly housed.

In October the veterinary officer was informed that 70% of poultry in Salalah had died of what sounded like a respiratory condition, possibly infectious sinusitis. Nothing is known of the poultry disease picture in the Province, husbandry methods as such are non existent.

There is a very real shortage of animal protein in Dhofar which is manifested by the anaemic condition of most of the people and the bloated bellies of many small children. At the same time the value set upon protein is indicated by the inflated price of small, low quality, goats and sheep.

Eggs and poultry meat could fill this need; what is required is:-

i. Education in better methods of keeping poultry (See Annex 'A' Better Poultry Keeping).

ii. The provision of <u>suitable</u> imported stock.

iii. The provision, initially, of imported feeding stuffs.

iv. Education of the public in the fact that eggs and poultry meat are perfectly good substitutes for goat and beef and that they can be produced more quickly and cheaply.

b) <u>Present system of poultry keeping at the livestock centre</u>

A hybrid flock of laying birds is maintained on the open yard system at Bir bint Ahmed. These birds are now laying well and appear to be in good general health. There has been a certain amount of mortality among the flock, principally from infectious sinusitis. The addition of powdered terramycin to the food, now appears to have brought this condition under control.

The importation of these birds has been a good public relations exercise as far as the "Hearts and Minds" programme is concerned, but it can only be regarded as a short term measure. Future importations should be of breeding units, surplus cocks could be sold off to the public. These cocks would at least produce hybrid vigour in the first generation. (See Durran's comments on poultry in Dhofar).

The present open yard system cannot be regarded as commercially viable, even in Dhofar. The cost of land and labour, not to mention concentrates is continually rising in much the same way as in other countries.

It is suggested that half the unit be converted to the deep litter system. Such a conversion might well prove more productive and even encourage more enterprising members of the public to take up poultry keeping seriously (See Annex 'B').

c) <u>The Future</u>

Poultry farming, given a little organisation is not a particularly arduous way of life, a factor which should appeal to the people of this country. It requires relatively little capital and not too much skill. There is a great shortage of protein in Dhofar which could be partly met by an increase in eggs and poultry meat. Members of the public should be encouraged to invest in the open yard system, or better still, in deep litter poultry farming. In a few years time this could lead to the satisfaction of local demand and even to the creation of a profitable export trade.

10. Donkeys and Camels

a) The Disease Picture

i. Donkeys

Little infectious disease has been observed in donkeys but nearly all are emaciated and anaemic. Malnutrition and general neglect are the principal problems in this species.

Many donkeys have been seen suffering from traumas caused by tight girths or badly fitting saddles and heavy loads. The practice of hobbling and tethering by the leg causes a considerable incidence of wounds and rope burns of the lower limbs.

ii. Camels

Like donkeys, camels suffer considerably from trauma of both the back and lower limb, but being more valuable, tend to suffer less from general neglect.

Trypanosomiasis is present in this species, but how widespread in incidence, is as yet unknown.

Many camels suffer from mange and spraying with "Gammatox" is one of the routine tasks of the veterinary service.

b) The Role of Camels and Donkeys in the Economy

Both animals still form the main source of motive power in the Province. Camels are used for cultivation and the transport of heavy loads and to a lesser extent as riding animals. Donkeys are used as the principal riding animal and for the carriage of smaller loads.

This pattern will continue on the Jebel, but on the Plain their use will decline, in the fairly near future. In fact with the rapid increase of motor traffic in Salalah and better road construction this is already happening. People will start to demand motor cars and tractors, even though in many cases, the use of animals would be far more economical. It is now accepted that certain forms of agricultural and forestry work are more economically and efficiently performed by animals than by tractors even in U.K. This surprising fact is often discovered only after stocks of suitable draught animals have irrevocably declined. One problem likely to arise from this trend is that of stray donkeys. Recently when I was treating a sick donkey, the owner informed me that he did not care whether the animal recovered or not. He said that he intended buying a truck and that donkeys are now worth very little when sold. This particular man was a squatter living in a hut made of palm thatch and rags!

Camels are much more valuable and could probably be sold to other farmers or the Jebali and are unlikely to be casually discarded. Camels may also be used for meat but donkeys are not acceptable for this purpose.

Should stray donkeys become a problem, it is suggested that they be impounded and where suitable, sold to the Jebali, otherwise they should be humanely destroyed.

c) The Sultan's Armed Forces

Donkeys of the larger Jebel Akhtar breed are used by the Sultan's Armed Forces and perform very useful work in mountainous areas.

Camels are not normally kept by the Army but may from time to time be hired from contractors for military purposes.

The vetinerary service will on occasion be called upon to give professional advice concerning these animals, and liaison should be maintained with the DAA and QMG at HQ Dhofar. Regular routine inspections will help to ensure that animals are kept fit for duty.

11. Sheep and Goats

a) The disease picture

i. Although little serious laboratory investigation has as yet been carried out on caprine or ovine diseases, it can be fairly confidently stated that tuberculosis, brucella and parasites both internal and external are prevalent in both these species. Living in many cases in their owners' houses they are potent spreaders of these conditions both to humans and other animals. They are thus important vectors of the zoonoses.

ii. The most common condition seen in individual goats brought to the VO is caprine pleuropneumonia. Widespread epidemics have been reported to have occurred in the past. The condition readily responds to the tetracyclines. It is interesting to note that response to antibiotics in general appears to be much more profound in veterinary treatment in Dhofar than in U.K. or the Far East, presumably because resistant strains of bacteria have not yet had a chance to establish themselves although there is every reason to suppose that they will in the future, as in other parts of the world. For this reason as well as for considerations of economy, the use of antibiotics has been restricted to those cases where they have seemed absolutely necessary. The tendency of the veterinary assistants to resort to antibiotics on every possible occasion should be strongly discouraged.

iii. Those goats and sheep whose lives are confined to the farmstead area, frequently suffer from lameness caused by overgrown feet. Fractured limbs are often seen, the cause being the practice of catching the animals by the nearest available leg and then dragging them into the enclosures. The assistants have been instructed in the art of foot trimming and in the correct methods of restraint. One of their duties is to pass on this knowledge to owners.

b) Importance in the economy

i. Sheep are not very numerous in Dhofar relatively speaking and little further specific reference will be made to them. However many of the points concerning goats, also apply to sheep, the two species living in very close proximity to each other.

ii. Goats are very numerous both on the Plain and the far Jebel. No estimates of numbers are available, but they must amount to many thousands.

iii. The possession of a large herd of goats is a mark of wealth and status and they still constitute an important form of capital investment for many Dhofaris. In any agricultural community a man's standing depends far more on the number of head of stock or acres held, than cash in the bank. Hence the concern for numbers rather than quality or productivity of livestock.

iv. The goat cannot be regarded as an efficient producer of protein in a settled and ordered agricultural economy. The practice of driving the goats to the Jebel from Salalah each day for grazing, means that much of the food eaten must be converted to energy for the very lengthy double journey. In effect a very inefficient agricultural commuter system. The same applies to those herds of cattle which are kept in a similar fashion.

The goat is essentially a feature of nomadic life and its only real place in the future lies on the far Jebel, where other stock would barely find a living.

By their habit of eating almost any form of vegetation, large herds of marauding goats do more harm than good and their effect is to be seen all over the eroded areas of Africa and Arabia.

c) Suggested future policy

i. Apart from the far Jebel where the goat will remain an important and essential feature of nomadic life, the people should be encouraged to keep cattle rather than sheep or goats.

This will be a long and difficult task because the goat holds such an important traditional place in Arab life. Any man may keep a few goats for little cost and effort, but the purchase and maintenance of cattle is a much more serious undertaking. Such a change of emphasis also implies the adoption and full acceptance of a settled way of life still foreign to many of the people of the Province.

ii. When further areas of the Plain are brought under irrigation and cultivation, which is the aim of the Agricultural Department, the wandering grazing of goats must to some extent be limited. Some form of zero grazing will then have to be adopted. This will greatly increase the efficiency of production of goat milk and meat and may to some extent limit the spread of the zoonoses. Unfortunately it will also increase the spread and virulence of such infections as caprine pleuropneumonia in herds. Methods of preventative medicine will then be required to play an increasingly important role.

12. The Jebel

a) Present state of knowledge

Most of the statements made so far refer to conditions on the Plain. Relatively little is known of the livestock situation here, but even less is known about the Jebel. Jack's report will always remain an invaluable source of information. Some brief surveys have been made by the writer (See Annex 'D') but these can only be regarded as superficial and much further basic work requires to be carried out. The first priority should be an investigation into water supplies, on which everything else depends.

b) The potential of the Jebel

The agricultural potential of the Jebel is infinitely greater than that of the plain. It possesses vast acres of grazing and to a lesser extent, of arable land. The soil in many parts is of good quality and considerable depth.

The livestock are numerous and of superior quality both in terms of meat and milk production.

The Jebel formerly produced appreciable quantities of ghee, cattle and goats for sale both to the Plain and for export. There is every reason to hope that it might do so once again, once the political situation has been stabilised.

c) Suggested courses of action

i. Geological Survey

The first requirement is for a geological investigation to determine the location and extent of water supplies. After which efforts should be made to develop those supplies for the use of the human and animal populations and where possible and necessary, for limited irrigation.

ii. Further Surveys

These should be carried out to study such subjects as soil structure, stock and population distribution and agricultural methods. A botanical survey of the prolific plant life would yield much useful information.

iii. Study of the disease picture

A study of the animal disease picture over a period of twelve months should be carried out. The aim should be to diagnose prevalent diseases and deficiencies and investigate those epidemics, which are reported to occur, particularly during and just after the monsoon.

iv. Extension Work

The aim of extension work should be to bring about simple improvements in methods of animal and crop husbandry and fodder conservation.

v. Development of Exports

If steps taken to increase livestock production are successful, markets for these products must be found. The sale of cattle, goats and ghee to the Plain and overseas should be developed. This should not be difficult because these primary products are in demand in Salalah and all over Arabia.

vi. Approach to Development

It is suggested that great caution be exercised in this development programme. Rapid changes would not be readily assimilated by people as primitive as the Jebali. The sudden influx of cash and manufactured goods might possibly cause much harm, as well as undermining their hardy character, it could lead to a rapid depopulation of the area and thus inhibit further development of agriculture.

What is needed here is a broad based, slow development, concentrating on simple improvements which will go far to improve the lot of the people, at the same time as raising output.

This must be one of the last sources of real wealth in Arabia. That is agricultural wealth as opposed to say, mineral wealth, which is a wasting asset. It represents one of the most interesting and challenging aspects of the programme, it should be approached with great caution and care.

13. Annual Veterinary Estimates

The veterinary officer is required to submit estimates to the Director of Development and the Estimates Committee for the following year's expenditure. The financial year commences 1st January.

Initially a fair proportion of expenditure will be required for fixed equipment and more durable items such as instruments and books. As the scheme progresses funds will tend to be allotted principally for drugs, salaries and extension schemes.

Estimates for 1972 are to be found at Annex 'E'. These do not in fact give the final figure arrived at, but, are intended only to act as a general guide for future veterinary officers.

14. The Livestock Economy of Dhofar

a) Reason for inclusion

Although this paper is intended primarily as a review of veterinary matters, basic economic factors must also be considered. Economics impinge more and more on any development scheme and they must be taken into account by the veterinary officer, when advising the Director of Development on future plans for livestock production.

As the scheme expands it may well be necessary to call in consultants to advise on the more complex aspects of the marketing and export of livestock products.

The points considered here however relate simply to the basic structure of any agricultural economy at whatever stage of development.

The closest liaison should be maintained with the Agricultural Department when formulating future plans, because the factors of production of livestock and crops are even more closely interrelated than usual in this Province.

b) The Factors of Production

i. The general situation in Dhofar

The factors of production in any enterprise are land, labour and capital. At present Dhofar possesses only land in any abundance. Its more efficient use offers the best possible approach for development.

Skilled labour is scarce and expensive and the object here is not to develop a labour intensive economy. Widespread use of hired labour is unusual, farm work is generally performed by the owner and his family. This is a subsistence economy and the aim is to raise it to a level of sufficiency and then if possible, of gradually increasing exportable surplus.

At present most capital for development is obtained from sources outside the Province. As agricultural production increases, capital will be generated within the Province itself and it will then contribute to the revenue of the state instead of merely abstracting it as at present.

ii. The Plain

The Plain at present has no more than 3000 acres under cultivation and the cattle population probably does not exceed 3000 head. It has been estimated that as much as 30,000 acres could eventually be brought under cultivation.

This would produce food for a much larger population of cattle, which should as far as possible be kept on a system of zero grazing.

There is potential for a very great increase in food crops and coconuts but this will not be discussed here.

The increased cattle population would be better breeding, feeding and management be far more productive. It is to be hoped that the ubiquitous goat will show a corresponding decline in numbers and those remaining, be more closely confined.

With the development of better human housing and an increase in road building, the demand for land will rise and this should bring about an intensification of cultivation. This will have an automatic limiting effect on the present wasteful methods of grazing and animal husbandry.

iii. The Jebel

This area presents a completely different picture. It has been estimated that there may be 1 million acres of grazing on the Jebel and a cattle population of 20,000 head. This last figure could be substantially increased by the retention of male calves for fattening as steers. Such a simple change of practice might require considerable education. and time, but should certainly be attempted.

Pressure on land can hardly be foreseen on the Jebel, in fact the main dangers are a decline in human population and also of cattle numbers if sales to the Plain are not carefully controlled. The Jebali should be shown that only by remaining on their land can they hope to make a steady and continuous income.

The requirement here is simply for a gradual improvement in the present system of extensive husbandry and suggested methods of approach have been discussed in Section 12 and Annex 'D'.

iv. Co-ordination of the Factors

The increase in agricultural production will, it is hoped, raise the standard of living at home and yield a surplus for export.

The dairy industry should produce various by products as well as fresh milk.

A slaughter house should be established which will provide not only meat but hides, glue and fertilizers as by products.

Similar developments will undoubtedly occur in the field of crop husbandry.

As well as exporting, there will be an exchange of products between the Plain and the Jebel, which did in fact take place in former times, on a much larger scale than it does today.

These improvements in the level of agricultural output will greatly increase the capital factor in the economy. This does not imply the inevitability or the need for the establishment of manufacturing industry, which would be irrelevent here. An interesting example of a not totally dissimilar situation is that of Denmark. Formerly a backward country based on subsistence agriculture, it has built up its present prosperity largely by increasing livestock output on a system where the basic unit of production is the small family farm, using simple but efficient methods.

15. General Policy

a) Fundamental aspects of change

The process of raising the level of livestock farming will be a slow one. The rate of pace of change will however increase, once the framework of the livestock service has been established and the benefits of better methods become apparent to the public. The veterinary service itself will probably require expansion and modification of emphasis in many aspects of its work.

The fundamental agents required to bring about the desired changes are not the veterinary hospital, the dairy farm or any other modern innovations, but continual emphasis on basic education in methods, particularly of the young and the improvement and propagation of the extension services.

b) A thought for the future

Although it is not intended to elaborate on the matter here, it should be observed that once food production has been significantly increased and the zoonoses brought under effective control, the size of the human population will show a marked and rapid increase. This inconvenient but inevitable fact is frequently overlooked when planning development programmes in backward countries.

16. Summary

a) The aims of the programme have been defined; they are -

i. to assess the livestock situation
ii. to establish the framework of a veterinary service.
iii. to point the way to future development.

b) The basic framework of the Provincial veterinary service has been established.

c) Education and extension programmes have been initiated.

d) A veterinary hospital has been planned and construction commenced.

e) The foundations of a dairy herd have been laid and suggestions made for future breeding policy.

f) The importance of poultry keeping has been discussed and suggestions made for future development.

g) The present and future importance of camels and donkeys has been examined.

h) The present position of sheep and goats has been examined and suggestions made for modifications in caprine husbandry.

i) A brief outline of the livestock situation on the Jebel has been given and suggestions made for future investigations and developments.

j) The basic factors of the economics of livestock production in Dhofar have been discussed.

k) In the section on General Policy the fundamental measures required to bring about change have again been emphasised.

17. Conclusion

Many radical changes must inevitably occur during the course of the development programme. These changes should be brought about as cautiously and painlessly as possible. Many old traditions will gradually be discarded, but they should not be ruthlessly swept aside, in fact wherever possible they should be retained. The object here is to improve the lot of the people, not to create a booming cash economy. If this is true of the people of the Plain, it applies with even greater force to the Jebali.

The views expressed in this paper are entirely those of the writer. They are based on observations made during an all too short posting of seven months. Nevertheless they largely concur with those of Jack and Durran, probably two of the greatest names in the annals of Middle Eastern agricultural development, the value of their reports is again acknowledged.

Future Directors of Development and their veterinary advisers may well take different views. Indeed many alterations of emphasis will of necessity occur in the light of changing circumstances and new developments and with the gathering of further information on those aspects of the subject, which as yet remain largely unexplored. The aim here has been to review present knowledge and achievements and to point the way in which future progress may be made.

The greater part of the work of the programme lies in the future. Those advances that have been made so far represent the combined results of eighteen months of effort by all three veterinary officers attached to the British Army Training Team in Dhofar.

The Province has great agricultural potential, the realisation of which will take many years. Only by persistent and painstaking application can the desired changes be brought about. By careful planning and utilisation of all the sources of information, there is every hope that those ends will one day be accomplished.

G.R. Durrant

G.R. Durrant
Major, R.A.V.C.

Salalah
17 March 1972.

HOW TO IMPROVE YOUR FARMING METHODS

DEPARTMENT of DEVELOPMENT

DHOFAR

September 1971

HOW TO IMPROVE OUR FARMING METHODS

CONTENTS

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1. THE IMPORTANCE OF BETTER CROPS

Cattle and other livestock are the most important farm products in Dhofar.

Crops are of secondary importance, but in order to improve livestock and milk production and to improve animal health, forage production methods must be greatly improved.

Remember too that well fed animals as well as being more productive are generally much healthier and more disease resistant than thin poorly fed animals.

2. BETTER CULTIVATION

How can crop production be improved by the farmer ?

Firstly by improved cultivation methods. At present land is ploughed to two or three inches by a camel drawn wooden fork, or a hand hoe (Minzaha). Seeds planted in such a seed bed do not have a very good start in life. Seeds which make a good start early will produce a better crop and have a better chance of resisting crop pests.

Cultivation by a tractor drawn plough will produce a deeper seed bed. Disc harrowing will produce the fine seed bed required. The Department of Agriculture will hire out tractors and implements at the very low rate of 750 Baisas an hour. Mr Abbus Sittar Basrah of the Department of Agriculture will give you information on this matter.

3. BETTER MANURING AND FERTILIZATION OF CROPS

Dhofar was formerly a very fertile area, but long neglect and bad farming methods have resulted in the soil becoming very poor.

A large number of cattle are kept in the area, but little care is taken to preserve the manure of animals. Animal manure is very valuable and should be carefully preserved. Manure should be gathered up from around the cattle and sheep pens and carefully stored in a heap and protected as much as possible from sun and rain.

The manure should be spread on the field just before it is ploughed. If it is put on any length of time before ploughing much of the value will be lost.

A farmer does not throw his money away or treat it carelessly yet he takes little care of farmyard manure which is really worth money because in the end it will help him to improve his livestock. At present much farmyard manure is burnt. You would not burn your money, so why burn manure which is worth money ? Farmers burn the manure to drive away flies. Try burning other material for this purpose, but dont burn manure. You are only burning money if you do this.

As well as using farmyard manure the farmer may also use artificial manure to help increase his crop output. The Department of Agriculture is arranging to import these substances and will make them available to farmers at cost price. The Department will give demonstrations on the use of fertilizers. It will also instruct farmers on their own fields on how to use it and these instructions will be free of charge.

4. ROTATIONS AND SOWING OF SEEDS Rotations and Sowing of Seeds.

Some crops tend to take more good out of the soil than others. If such crops are grown too often they exhaust the soil. If the same crop is grown continually on the same piece of land, the soil not only becomes exhausted but pests build up and destroy the plants.

To avoid such a situation we practice what is called crop rotation. Bad rotations might be Sweet Potato followed by Sorghum, or Sorghum followed by Sorghum. Both exhaust the soil, and in the second case an increase of crop pests might well occur.

Better rotations might be lucerne followed by Sorghum, or lucerne followed by fallow, or lucerne followed by fallow followed the next year by sweet potato or Sorghum. If you are in any doubt about what rotation to follow the Agricultural Officer will advise you.

Now we must consider better methods of sowing the seed. The usual method of sowing seed is to scatter it over the ground by hand. When the seeds grow, weeds spring up among the plants and weeding takes a great deal of time.

If the seed is sown in lines a foot apart, weeding becomes very much easier. A man may weed up to thirty times as much land in a day where seed has been sown in this way.

The Agricultural Officer will show farmers how to sow seed by this method and the Department will be able to loan implements for this purpose.

You will find that sowing seeds in lines will greatly increase your crop production.

5. PLANT PROTECTION METHODS

Many crops sown in Dhofar are never harvested because they are destroyed in the early part of their lives by pests. Young lucerne is often destroyed by insects or choked by weeds.

To overcome this problem lucerne should be sown in rows. This makes weed control very simple. Lucerne is now being sprayed to control insect pests.

Where young plants are attacked by insects they should be sprayed as soon as possible. The Agricultural Officer will arrange to do this at very low cost.

Sorghum crops are frequently destroyed by stem borers. This means that a great deal of fodder is wasted. To overcome this spraying is again the best answer.

After the Sorghum has been harvested the stubble should be deep ploughed or burnt. No stumps should be allowed to remain as these may contain stem borers which will spread to the new crop.

6. CULTIVATION OF OTHER CROPS

As well as growing lucerne and sorghum it has been found possible to grow many other fodder crops in Dhofar. Some of these crops give a very much higher yield per acre.

Examples of these are:

For early summer

1) Bullrush crossed with Napier Grass.
2) Rhodes Grass.
3) Cow Pea.
4) Bajri.
5) Reshaidia Grass.

For late summer

1) Maize.
2) Teosinte.
3) Teosinte crossed with Maize.
4) Panicum Solanum.

A crop of Sorghum may yield ten tons per acre, but bullrush

crossed with Napier Grass may give fifty tons per acre. Thus many more animals may be fed from the same piece of land.

Farmers should consider growing some of these crops on their land. They should not let old fashioned customs of farming prevent them from trying something new.

Results obtained in Dhofar have shown that these new crops will produce much more food for animals, and the Agricultural Officer will provide seed and advice on developing these crops.

7. MAIN POINTS TO REMEMBER WHEN TRYING TO PRODUCE BETTER CROPS

a. Better crops produce more food for your animals. Well fed animals will produce more milk and meat, they will also be more disease resistant.

b. Better crops can only be obtained by good cultivation. Deep ploughing and subsequent harrowing will produce the seed bed needed.

c. Plants need food in the same way that animals and people need food. By careful use of farmyard manure and artificial manure crop yields may be greatly increased.

d. By growing the same crop every year on the same piece of land the soil becomes tired and disease builds up. By using the correct methods of crop rotation this can be avoided, the soil will be improved and the crop yield increased.

e. Seeds which are scattered over the soil may often be choked by weeds. If seeds are sown in lines then the weeds are easily pulled out and the young plants are able to make a better start in life.

f. Many crops are eaten by insects before they are harvested. By using modern sprays these insects may be killed and the young plants left unharmed. When a crop has been harvested the stubble remaining should be ploughed or burned, so that any insect pests remaining will be destroyed.

g. Many new crops may now be grown in Dhofar. These new crops often produce more food per acre. Why not consider growing some of these crops on your own farm ?

8. THE IMPORTANCE OF HEALTHY ANIMALS

I will begin by asking you a question - is it better to have twenty cows, many of which are sick, or ten cows all of which are healthy ?

A lot of farmers in this country think they are rich if they possess a large number of animals. even though many of these animals are unhealthy.

It is better to have a healthy flock or herd because healthy animals will give more milk and meat and produce a greater number of young. In the case of camels and donkeys they will perform their work better if they are well fed and free from disease.

A farmer with healthy animals will be able to produce more food for his family and so they will be healthier as well. He will also have more livestock products to sell in the market which means that he will have more money to buy things for himself and his family.

I think this will make you see that everybody will benefit by improving the health of farm animals.

9. BETTER BREEDING OF ANIMALS

In order to produce healthier animals we should start at the beginning with the young animal.

A cow will usually only produce one calf at a time, but one bull may be the father of many calves at the same time. A strong healthy bull is much more likely to produce a strong healthy calf than a poor quality bull.

When deciding to keep a bull or a he-goat or a ram we should therefore look for one which is strong and healthy. Such an animal will have been produced by a strong healthy mother.

Many farmers use male animals for breeding which are of poor quality. Do not do this. They should only keep ggod male animals for breeding. If they do this they will quite quickly raise the whole standard of their flock or herd. This is also true in the case of donkeys and camels.

We can see from this that if we are to breed better livestock we should only breed from good quality male animals.

10. BETTER FEEDING OF ANIMALS

People who do not have enough to eat are weak and not able to do much work. They are more likely to be affected by illness.

The same is true of our animals. If we give our animals plenty of good food they will give more milk and meat and produce more young. Camels and donkeys will be able to do more work. Animals which have plenty of food will not be so likely to become ill.

We can see that if we give our animals plenty of good food they will be healthier and the farmer will in turn become richer.

11. MASTITIS

This is a disease which effects the udder of milking animals. If the disease is neglected the animal will produce little or no milk at all. It may even lose the use of its udder altogether when it has young next time.

In many cases mastitis can be prevented. This is done by keeping the udder clean to prevent infection entering the teat. Before you milk an animal :

Wash your hands in clean water
Wash the udder in clean water
Make sure your hands and the udder is dry before you start milking.

Unless you intend to let the young also take milk from the animal, all the milk should be removed from the udder.

Try to milk the animal at the same times each day.

If you think the animal has anything wrong with the udder call the Vetinary Officer at once. Do not wait for several days because the delay may mean that the disease becomes much more serious. Neglect of mastitis may mean that the udder is damaged permanently.

If an animal has mastitis in a teat, milk it out, throw the milk away or bury it in the soil or put it on the fire. Then wash your hands carefully with soap and water or you may spread the disease to another animal.

12. TREATMENT OF WOUNDS

Animals may suffer from wounds for many reasons. Some may be caused by cuts from stones or thorns. Camels and donkeys often suffer from sore backs because of heavy loads on badly fitting harnesses.

Whatever the cause wounds should be treated promptly and correctly. Wounds which are neglected may allow infection to enter the animals body, making it ill or even causing its death. Wounds in animals may cause pain and this often leads to loss of condition.

Many people in Salalah treat wounds by applying dung or charcoal. This is a traditional practice. Others may burn the wound with a hot iron hoping to cure it by that method.

These old methods are quite wrong. They may delay healing or even cause infection resulting in death. If one of your animals suffers from a wound, carefully clean the area with a mild solution of an antiseptic, or if you have no antiseptic use salt mixed with clean water. Try to prevent flies from settling on the wound, because flies annoy the animal and often spread disease.

Wounds are best treated by the Vetinary Department. If your animal suffers from a wound, even a slight one, call on the Vetinary Department. and they will take measures to treat the wound. Remember - call the Vetinary service early.

13. HYGIENE

Hygiene simply means the practice of clean habits, and is as important for maintaining animal health as it is for human health. The two are in fact dependent upon each other.

Most people like to keep their bodies and their clothes clean. Very few realise that cleanliness is just as important for animals.

Manure and rubbish that accumulates in the place where animals are kept should be carefully removed at frequent intervals. The rubbish should be burned or buried and the manure carefully stored for use in the fields. The manure should be covered to protect it from sun and rain and if possible flies.

Flies should be controlled as much as possible. Why is fly control so important ? This question can be answered by watching the habits of flies in your house or around the livestock enclosure. Flies feed on manure and rubbish and then feed on food or crawl over peoples faces. They often get into eyes, particularly those of young children or weak animals. Flies spread disease in this way and often blindness is the result.

We can partly control flies by using a routine of cleanliness in our house and the farmyard. Food should always be covered, flies should not be allowed to crawl over food. Manure and rubbish should be frequently removed. Many farmers often use fires to drive away flies but it would be much better if they removed the dirt where flies live and multiply.

Fly sprays are a useful way of killing flies and it is sometimes necessary to spray animals to reduce the attacks of flies and other pests.

Hygiene is important where wounds are found on animals. The wound should be cleaned and covered to prevent the spread of infection.

Animals that have diarrhoea often spread the disease to others. Such animals should be kept away from the other animals and also not allowed to be near food stores. When the animal becomes soiled with diarrhoea it should be cleaned at frequent intervals. Failure to clean the animal is bad hygiene, the animal becomes sore and further infection may occur. Such animals lose condition quickly, partly because they have diarrhoea but also because they are very uncomfortable.

Milk is often a cause of spreading disease, dirty milk is full of germs. Hygiene should be adppted when milking an animal and milk should only be kept in containers which have first been well washed in clean water.

When animals are fed from troughs or other containers these should be thoroughly cleaned each day. Dirty feeding containers spread germs and other disease organisms and reduce the attractiveness of the food to the animal.

Animals which are kept in clean conditions will be more comfortable and so produce more milk and meat. Clean conditions for animals will also be healthier for the humans who look after them, or live near them.

Hygiene should become a habit, this may be difficult at first but once a routine is established it will be much easier.

If you would like advice on hygiene routines, you should ask the vetinary service to help you.

This is an internal disease, found mainly in cattle. It is not caused by germs but poor feeding. It is generally found in cows which have recently produced a calf. It is brought about by the strain of producing a calf and the giving of milk.

The symptoms are trembling and staggering, loss of condition, and because the cow is feeling so unwell, a loss of appetite.

The milk and urine have a sweet smell which is quite easily recognised. If you think you have a cow suffering from this disease you should call for vetinary assistance.

It is better to aim to prevent the disease by good feeding than simply waiting for it to appear and then curing it. Remember prevention is always better than cure.

15. CARE OF THE ANIMALS FEET

Cattle, goats, and sheep are all prone to foot troubles if the feet are neglected. The foot grows long and this may lead to permanent distortion of the whole foot.

An overgrown foot may pick up infection and lameness results. Lameness may cause a great deal of pain and this will cause the animal to lose weight and give less milk. A grazing animal may be prevented by lameness from moving about to pick up its food and this will lead to further loss in weight.

Feet should be regularly trimmed to prevent these troubles. The trimming should not be too severe or this itself may cause lameness and the entry of infection.

The Vetinary Officer will show you how to trim an animals foot, after which you will be able to do the job yourself if needed.

16. CARE OF THE EYES

Damage to the eyes may be caused by dirt, wounds, or flies. Damage to the eye causes pain and may lead to blindness. An animal with damaged eyes will not be able to see to find its food and will soon lose condition. It will produce less milk and meat.

You should aim to prevent eye infection by good hygiene. If your animals are suffering from any form of eye trouble you should call the Vetinary Officer at once. Neglect and delay may lead to permanent damage, early treatment is most important.

17. WORMS

Worms are creatures that live in the stomach of animals and people. These worms require food and take it from the animal in which they live. You would not throw away your animals food, but if they are infected with worms, this is just what you are doing. What are the signs of worms ?

loss of condition — poor coat
weakness — diarrhoea

Worms may be spread by bad hygiene and overcrowding. They spread rapidly from one animal to another. You should aim to prevent the spread of worms by good housing, better hygiene and better feeding. The Vetinary Officer will test your animals for worms and give medicine if needed.

Remember: Worms eat your animals food and this leads to loss of milk, loss of health, loss of meat and this means loss of money.

18. MAIN POINTS TO REMEMBER WHEN TRYING TO PRODUCE BETTER ANIMALS

a. Good health begins with a good start in life. Breed better stock.

b. Try to understand the causes of acetonaemia and mastitis and remember the methods of preventing them.

c. Take care of your animals feet. An active animal is a better animal.

d. Care for the eyes - a blind animal is worth much less than one which can see.

e. Control worms - these can devour your animals food and so really eat your money.

f. Remember healthy animals are important because sick animals can spread disease to other animals and human beings. Healthy animals will give more milk, more meat, more young ones, and so give more money.

Remember that by improving your farming methods you will in quite a short time also improve the health and prosperity of yourself and your family

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BETTER POULTRY KEEPING

Many people in Dhofar keep a few chickens which run about the yard picking up scraps and occasionally laying a few eggs. Very few people however realise that poultry can be the quickest and simplest producers of animal protein.

Poultry produce both eggs and meat and these are very valuable foods. By increasing the level of protein in your diet you will improve your health. If you have eggs and chickens to spare you may sell these and thus improve your income as well.

Most poultry owners regard their chickens as creatures that happen to be there. They seldom bother to provide them with food or water, allowing them to roam about and pick up their food as they can. The result is that these chickens seldom grow to any size and produce very few eggs.

Chickens are like humans and cattle, in that they are healthiest when they are given regular supplies of food and water. Would you neglect to give your family or your cattle food and water? Certainly not, so it would be to your advantage to treat your chickens in the same manner.

Remember with a little care chickens will produce food more quickley and cheaply than cattle.

Many chickens spend most of their time in sm all hutches or caves made of stone. These places are dark, unhygienic and so unhealthy. When kept in these housing condithions chickens often go short of food and water.

How may we improve our methods of keeping poultry? Firstly we should provide a good supply of water. Place a bowl of water where the chickens can drink at any time. Place th e water in the shade and keep it clean. Eggs contain a lot of water, if they are short of water, chickens will produce very few eggs.

Next we should improve the food supply. Chickens should be offered some or all of the following:

Wheat
Rice
Flour
Bread
Maize
Vegetables
Grass
Fish
Household scraps

Place the food in a trough, this will keep it clean and help to avoid waste. Prevent other animals getting near to eat this food.

Chickens require only a small amount of food each day, so that providing the diet described will cost you very little in effort or money, but the return will soon be quite considerable.

The housing of chickens is an important subject which is frequently neglected. They should not be kept in dark caves but given a light airy enclosure. Provide them with some shade and perches to rest on at night. They should not be allowed to run about at will but kept in an enclosure. This will allow space for exercise but not enable them to expend to much energy running about. If chickens are given a good diet they will not need to run very far. The houses and pens should be cleaned out frequently and the manure used on the fields in the same way as pen manure from cattle.

Chickens are liable to suffer from diseases in the same way as other animals. The most common conditions seen in Dhofar are diarrhoea and infection of the nose and throat. Sickness is often present when chickens are short of food or given the wrong sort of food. By providing good food and housing, you will often be able to prevent sickness.

If your chickens are showing signs of sickness call the veterinary officer at once.

Remember the advantages of better poultry keeping are more eggs, more meat, better health for you and your family and more money too.

Poultry are not expensive to keep, they do not require much effort. Why not try keeping a few or if you already keep some, keep a few more and look after them in the way suggested. By doing this you will soon increase your own health and wealth and also help to improve the economy of our country.

If you would like any advice on poultry keeping call and see the veterinary officer or the agricultural officer at Bir Bint Ahmed, they will be very pleased to help you.

THE CULTIVATION AND UTILIZATION OF COCONUTS

Coconuts flourish in many parts of the world and are particularly suited to Dhofar. The coconut palm gives rise to a number of products and is a most useful crop.

It is estimated that there are about 50,000 palms in Dhofar, yielding some 2,000,000 nuts each year.

Almost every part of the coconut and its parent palm may be used. The nut itself provides a refreshing drink and the meat is good for food. The meat may be treated to produce oil which has many uses, the residue, known as copra, may be used as a feeding stuff. The coir (a fibre encasing the nut), also has many uses and is a valuable by product of coconut production. The leaves of the tree and the wood may all be used in various ways, so nothing need be wasted.

There are two main varieties of coconut palm, these are the dwarf variety and ordinary tall variety. The dwarf commences yielding in the fourth year after planting, while the tall variety will start yielding at about the seventh year. Palms are at full production at about sixteen years and generally have a life span of 80 to a 100 years.

Flowers are produced every month and from the appearance of the flower to the harvesting of the mature nut a period of about 300 days elapses.

The coconut palm requires a warm humid climate and a rich soil with sufficient sand to give good drainage. A fundamental need is an abundant water supply, either in the form of rainfall or irrigation.

It will be obvious to you that Dhofar provides the conditions described and so the coastal plain of our country is very well suited to the production of coconuts.

How are new coconut palms produced? They are produced from nuts, so every care should be taken when selecting nuts for use as seed. Nuts should only be selected from healthy high yielding trees. The nut should be ripe and picked just before the Monsoon, about April or May. The nut should be carefully handled, it should not be dropped from the tree, but lowered by a rope to avoid damage.

A seedbed should have been carefully prepared and given a dressing of farmyard manure. The nut should be planted at 10" apart and in rows at intervals of 15". The nut should be placed on its side and covered with soil to a depth of 3". In excessively hot weather temporary shade may be provided. The nuts may be left in the nursery until the next Monsoon, when they should be planted out into the field. By transplanting during the Monsoon sufficient time will be allowed for the young seedlings to become established.

Planting in the field is in pits 3' x 3' x 3' and at 30' between plant and plant and row and row.

/The...

The pits should have deen dug some time before planting to allow the soil to weather. The pits should be treated with aldrin, as a precaution against white ant. They should be given a liberal amount of farm yard manure.

Irrigation will be necessary except during the rainy season. Irrigation should be carried out twice weekly in the dry period.

Quite a large area of land between the rows will be out of use after the young plants have been put in. This land may be utilized by growing crops of lucerne or cow pea between the rows.

The young plants should be treated with farm yard manure and chemical fertilizers. If you have any queries on the use of these substances, the Agricultuaal Officer will advise you about the best course to follow.

If you follow the advice given, your trees should start to yield in 4 - 7 years' time.

Remember the cocunut is a most valuable crop, because it produces so many useful by-products.

Machinery for the treatment of copra, extraction of oil and manufacture of coir goods, will shortly be imported into Dhofar.

The coconut industty once flourished in this country, but it was allowed to decline. A new era of development under H.M. Sultan Qaboos bin Said has now commenced. One of the most important items in the new development programme is the revival of the coconut industry.

If you are interested in developing your own coconut palms or planting new ones, call and discuss the matter with the Agricultural Officer at Robat. He will be very pleased to assist you.

By growing more coconuts on your land you will not only bring benefits to yourself and your family, you will also help the forward moving economy of our country.

...cont\

Annex 'B'

POULTRY PRODUCTION AT Bir bint Ahmed

a. Poultry are the quickest and simplest producers of animal protein, giving both meat and eggs.

b. No system of poultry husbandry exists in Dhofar, such hens as are kept, scavenge for their food and cannot be regarded as productive.

c. The present system of poultry husbandry at Bir Bint Ahmed is not at all satisfactory. The open yard system is expensive in terms of housing and fencing. It is wasteful of land. Food utilisation is poor, because the hens scatter the food and use excess energy in running about. The house is poorly ventilated and particularly difficult to clean, this results in bad hygiene and inefficient use of labour. The system was largely abandoned in UK twenty years ago for these reasons.

d. If the aim is to demonstrate the yard system of poultry husbandry to farmers, it would be more appropriate to have a small scale unit.

e. The alternative here would be to adopt a more intensive system. Battery cages must be ruled out because of the very high initial capital outlay involved. Another approach might be to adopt a deep litter system.

f. The features of this system are a more efficient conversion of food to eggs and eventually meat, because exercise is restricted and food consumption can be more easily controlled. The system is very hygienic, cleaning of the house would be required only twice a year. The task of cleaning is very much pleasanter because of the bacterial action of the litter. At present obtaining labour to clean the houses is proving a most serious problem. Capital outlay would be considerably reduced and land area saved.

g. The following action is suggested. Half the existing poultry building should be converted to the deep litter system. The open parts of the building should be blocked off. The floor will require covering to give a solid base, and peat moss spread to a depth of 6" - 8". Two air conditioners should be installed. The two systems would then run side by side and comparisons made. Feather picking should be controlled by correct vitamin balance, plenty of green food and if necessary debeaking.

h. If the livestock unit is intended to encourage enterprising Dhofaris to keep poultry commercially then the deep litter system has far more to recommend it than the present system. The main deterrent for such people at present would be lack of air conditioners and power supply, but this should soon be overcome.

i. Should the deep litter system prove totally unsuccessful it would be possible to revert to the old yard system. Very little capital would have been involved. The veterinary officer strongly recommends attempting such a project. There is little to lose and possibly a great deal to gain by carrying out this experiment.

G.R. Durrant
Capt. R.A.V.C.

Salalah
10 Oct 71

Annex 'C'

From: Veterinary Officer

To: Director of Development, Dhofar.

THE MEAT TRADE

Ref. A: Your minute dated 22 Oct 71.

1. Holding Place for Incoming Cattle

(a) The Baleed area will certainly be the most suitable site for holding animals, because food and water are available nearby.

(b) There should be enough feed available here. Bullrush and other coarse fodders would be the most suitable and the supply of this should be adequate. Each animal should be offered about 30 lbs of food per day.

2. Design and Siting of Slaughterhouse

(a) Ideally this should also be at Baleed, the main requirements here will be a good water and electricity supply. Water is no problem, but if necessary electricity should be provided by means of a portable generator until mains supplies can be connected.

(b) The design should be kept as simple as possible and should comprise the following:-

(i) Lairage (Collecting Yard)

Here cattle are brought in to rest for 12 to 18 hours prior to slaughter. They are offered water but no food in the compound.

(ii) Slaughter House

This should be a simple room with plenty of space and a good water supply and washing down facilities. The animal will be slaughtered here, dressed and lifted onto a hoist for conveyance to the Setting Room.

The Slaughter Room should allow for the effective collection and removal of blood and offal. The latter should be removed for use as fertilizer (this subject will be discussed with Mr. Basra). Hides will also be removed here and the possibility of exporting hides will be investigated.

(iii) Setting Room

Before being frozen meat must be allowed to "set" for 12-18 hours after slaughter. The Setting Room should if possible be kept free of flies, air fans and extractor fans should be provided. Again, drainage should be good.

Carcasses will be removed from the Slaughter Room to the Setting Room on a sliding overhead rail.

A leading ramp should be incorporated at the exit to the Setting Room, for loading the lorries, which will convey the carcasses to the Cold Store.

Those carcasses destined for consumption by the local civilian population may well not require setting, in which case they could be removed immediately after slaughter.

Meat inspection would be carried out by the Veterinary Officer in the Slaughter Room, just prior to the carcass entering the Setting Room.

Valuable offal such as heart, liver and kidney should be retained for sale either locally or for the export trade.

3. Preservation of Carcasses

Carcasses for local consumption may be removed for sale either before or after setting.

All meat for consumption by Europeans or for export must be frozen.

The Defence Department could offer us about ten tons of storage space. This would represent about 50 carcasses.

Meat must first be chilled before being deep frozen. The effect of opening the cold store for the entrance of the carcasses will sufficiently raise the temperature for chilling to occur over a period of about 10 hours. After this the cold store will return to its normal level and the deep freezing effect will take place.

4. Consumption of Meat in Salalah

Figures for this have not yet been ascertained but the following figures may act as a guide.

Local civilian consumption might be at 20 cows per week. The contractor should be approached on this matter. At present cattle are fetching about R.S. 60 each for slaughter. These animals are little more than half the weight of Jebali cattle and are of low quality.

It has been suggested that by putting cattle on the market we might depress the goat and sheep trade. As goats (again of low quality) are fetching up to R.S.12, a most inflated price, this can only be regarded as a good thing, as far as the consuming public is concerned.

It is possible that Spinneys might take up to 25 cattle per week for Army and Taylor Woodrow consumption, but this must be negotiated.

5. Production of Meat for Export

(a) The export of cattle on the hoof would be in many ways the best solution. The movement of cattle in dhows would, however, be at best a most hazardous undertaking and cannot be regarded as feasible at this stage.

(b) I still feel that the movement of cattle by road would be a good method and might be borne in mind as a future possibility. Until the road to Midway can be cleared of enemy forces, nothing further can be done in the matter.

(c) The alternative is to move frozen carcasses to Muscat by sea and all methods of doing this must be investigated.

An officer who is shortly to leave the Sultan's Service has put the following plan to me, which I think is worth consideration:-

(i) He would provide a ship with freezer accommodation. It will take at least 8 weeks to obtain this ship from Europe. As far as I know, no company operates freezer ships in this part of the world, or would be prepared to do so, for the relatively small trade envisaged at present.

(ii) He would charge £9.00 (or 22½ baizas per lb.) per carcass for transporting to Muscat - a very reasonable figure.

(iii) He would require a guaranteed figure of 500 tons per annum, after that freight would be free.

(iv) To guarantee the above figure, we would need to produce 20 tons or 100 cattle per fortnight.

(v) We would be required to load the carcasses on to the ship at Salalah.

Two main factors would be needed to ensure the success of such a scheme, these are:-

An adequate supply of cattle from Salalah; and
A sufficient market in Muscat to absorb our production.

The officer concerned has now left for Muscat, where he is investigating the market situation.

Such a scheme, if successful could be a very profitable undertaking for the government, it is certainly worth investigating.

6. Other Products

(a) Hides and skins were formerly an export product from Dhofar and could again be a profitable sideline, should a meat trade be developed.

(b) Those cattle held in Salalah giving milk could certainly be milked at Baleed. Milk production here could be part of the milk trade which we hope to develop at Bir bint Ahmed and should present few problems.

Conclusion

There is certainly a potential market for meat of good quality and reasonable price in Arabia, as in all parts of the world. Dhofar has great potential for meat production as for other farm products. Perhaps the present threatened crisis could act as a catalyst for the initiation of the meat trade, for the home and export markets. All the avenues outlined should be fully explored as soon as possible.

G.R. Durrant
Capt. RAVC.

Salalah
23 Oct 71

Annex 'D'

REPORT OF VISIT TO JEBEL 7.10.71 - 9.10.71

BY CAPTAIN G.R. DURRANT, R.A.V.C.

1. AIM. To recce the liberated area and report on the general situation and the possibility and need for future development.

2. GENERAL DESCRIPTION OF THE AREA. The area visited was at Jib Jat code name 'Chalk Pit' Map Square 3010, height 3,500 feet. The area was a very large plateau on which had been built an air-strip. The plateau was surrounded by deep Wadis which are reported to flow with water in the monsoon.

By day the temperature almost equalled that of the plain, at night it was very cold and several blankets were needed.

Jib Jat is at the furthest extreme of the inhabited Jebali territory beyond it lies the Negd. This area is inhabited by the true Bedouin who keep a few goats. Said bin Ghir said the area abounded with wild deer. Beyond the Negd lies the Empty Quarter.

3. SOIL. The soil on the plateau extended to a depth of 2'0" in places and was not particularly stony. A large number of stones lay on the surface but cultivation would not present many problems were the area in a more accessible place. The soil appeared to be of good quality and a random sample was taken for analysis.

4. VEGETATION. The vegetation consisted of scrub and thorn on the side of the Wadis but the plateau was covered with a sparse layer of grass now turned brown with the ending of the monsoon.

The dry grass provided grazing for large numbers of goats kept in the locality.

Said bin Ghir informed me that there was enough grazing and water here to support the stock throughout the year, but that just before the onset of the monsoon herbage becomes very sparse indeed.

5. WATER. No large water holes were seen, but several water seeps were visited. These are found in the edges of the Wadis generally under a cliff overhang. Some of the seeps obtain their supply from seepage percolating downwards and dripping into a small pool and also in some cases by upward flow from small springs. In the monsoon it was reported that some of these springs turned into gushing torrents and evidence of this could be seen in the stream beds.

Some of these seeps dry up prior to the onset of the monsoon.

A very heavy dew falls at night though this probably has no significant effect on the vegetation in the dry season.

Very little is known of the water table in this area. Said bin Ghir said that drilling at some of the springs would greatly increase the water supply and assist the graziers. Certainly when peaceful conditions return it would be desirable for geologists and engineers to investigate the water supply in the dry season.

6. HUMAN POPULATION. About 40-50 people of both sexes and all ages were seen in the area. They comprised several families, all of the same clan and were of pure Jebali stock. Very few spoke Arabic, they were shy but not unfriendly, this was probably explained by the generous free issue of Army rations!

All the people seen appeared remarkably healthy. They showed little sign of anaemia and had sound teeth. They were fairly small in stature but quite well made and agile.

The M.O. agreed with me that all the people and animals he had seen were far healthier and stronger than those seen in the plain. It must be concluded that a very vigorous process of natural selection operates here. A perfect example of 'survival of the fittest'. The M.O. estimated that in this situation an infant mortality rate of 50% would be expected.

No houses of any form were seen, families simply crouched round fires under cliff overhangs. The people had almost no possessions apart from few cooking utensils and water skins.

Diet consists of milk, meat and a few beans, the latter purchased from the lower Jebel. In peaceful times the people purchased foodstuffs from Salalah using money obtained by the sale of the goats.

Although people appeared generally healthy the M.O. thought that T.B. and Malaria could be prevalent among the population.

7. ANIMAL POPULATION

a) Cattle. These are not as plentiful as on the lower Jebel however a group of fourteen cows and heifers and one young bull were seen at the water hole. These provided the most interesting feature of the whole survey.

The cattle were surprisingly European in appearance, only a few having a slight suspicion of a shoulder hump. They were very much larger than the plains animals and all were fat (it should be remembered of course that the monsoon had not long ended). The udders were well developed and full and from appearance I would estimate the yield to be 2-3 times greater than in plains cattle. Seeing these cattle made the estimated figures for ghee production seem very credible.

The cattle appeared to be of three distinct types and would have passed in the U.K. for Friesian, Jersey and Ayrshire respectively.

The animals seen were very agile in spite of their bulky frames, legs and feet were strong and well formed, a necessity when climbing up the stony wadi slopes.

Watering of cattle takes place either daily or every two days. The animals seen seem to have developed the ability to go without water for up to 48 hrs in common with the plains cattle. The water holes were walled off with stones to prevent the animals soiling them and cattle were watered individually from a basin.

The cattle seen appeared free of ticks and no coughing was heard. Milking takes place twice daily.

b) Goats. Several large herds of goats were seen, they must have numbered many hundreds.

The striking feature of these animals was their remarkable size and healthy appearance. All who saw them commented on this. Again milk yield appeared to be quite considerable.

Goats and cattle were driven out during the day to search for grazing returning to the family cave area at night. Goats appear to be watered at night as opposed to the cattle which are watered at dawn. At one water seep it was reported that 300 goats watered daily.

Faeces samples were taken from cattle and goats for investigation for parasites.

c) Donkeys and Camels. These do not appear to be numerous in this area. Only one of each was seen but both appeared exceptionally well fed and healthy.

8. ANIMAL HEALTH - GENERAL PICTURE. Nearly all animals seen appeared remarkably well fed and healthy. It is difficult to predict what diseases might occur, a survey over a wide area over a period of at least twelve months would be needed.

Said bin Ghir said serious epidemics often occurred in the lower Jebel at the end of the monsoon season. His description of symptons was not clear but in cattle they could have referred to Lumpy skin disease and Bloat and in goats Caprine Pleuropneumonia.

A few goats were treated for minor conditions such as cuts and conjunctivities but very little individual veterinary treatment was necessary. However the local people were delighted that Tabib al Haiwan should examine their stock.

At this stage there could be no justification for stationing a veterinary assistant in the area.

9. AGRICULTURE. At present no cultivation is carried out in the area but there would seem to be no reason why limited cultivation should not be carried out in the monsoon. It would be possible to grow fodder for hay and such crops as beans to supplement the human diet.

Cultivation is reported on the lower Jebel by both the legitimate inhabitants and the enemy forces. (Agriculture is an important subject in communist guerilla training and some of the enemy have received instructions in the art of growing crops). Our own forces have generally refrained from destroying crops for fear of depriving the indiginous population.

10. POSSIBLE LINE OF ACTION. This survey only represents a first and possibly superficial impression. Nevertheless the main features described made a very strong impression on the writer and on most of the officers in the area. Summarising, these were deep apparently rich soil, the health of the people and the large numbers of vigorous well fed animals.

The question now arises what progress is either desirable or necessary? The people have obviously struck a balance with their surroundings which suits their extremely primitive existence. Any developments should be undertaken with caution or this balance could be disastrously disturbed.

Until a clear picture of the life of the people and their animals through twelve months can be obtained, it is not possible to forecast what their serious problems might be.

It is suggested that when peace returns the main features should be medical and veterinary aid to deal with serious individual cases. Prophylactic measures to counter the more serious epidemics when these are understood. Development where possible of water supplies and

following on from this, limited agricultural development. Intensive agriculture even if it were possible would not be desirable as these people are essentially nomads and graziers.

The main need now is for more information from doctors, veterinary surgeons, agriculturalists, geologists and well drilling engineers. This information will only start to flow when the area is fully pacified.

G.R. Durrant
Capt. R.A.V.C.

9.10.71.

REPORT ON A VISIT TO THE JEBEL

17/18 OCTOBER, 1971, BY

CAPTAIN G.R. DURRANT, RAVC

1. AIM

To recce the area at West Group (Map Ref 2100) and report on the possibilities for future development.

2. GENERAL DESCRIPTION OF THE AREA

Rolling open country, thickly covered with long grass, now brown with the ending of the monsoon. Height 3000 feet, cooling breeze by day. A few large leafy trees offering good shade. The area is like Salisbury Plain, only the soil here is better.

3. SOIL

The topsoil consists of black earth to a depth of one foot. Few stones were found in the soil, though quite a lot of stones were scattered on the surface. A soil sample was taken for analysis. The subsoil consists of chalk and some clay.

4. VEGETATION

This is true grassy upland country. The grasses seen were of the agrostis, bent type, with quite a large amount of a wild bearded wheat type grass.

The weeds most prominent were of the family umbelliferae, identical with cow parsley, and a prickly solanaceous plant, like wild tomato.

The great amount of "foggage" indicates that relatively little of the vegetation is eaten during the monsoon by the grazing stock. The amount going to waste far exceeds the amount utilised, which would explain the apparent high humus content of the topsoil.

5. WATER

The water supply was difficult to assess, but there appears to be a much larger human and bovine population here than at "Chalk Pit", so water must be fairly plentiful. No water holes were seen here but several were reported to be present nearby. Several storks were seen, possibly indicating water presence. There is a most urgent need for a visit by well drilling engineers. Improvement of water availability should have a considerable morale raising effect on the local population.

6. AGRICULTURE

Several cultivated fields were seen in the vicinity of the occupied area. These were fenced in with dry stone walls and covered up to one acre in area. The crops seen consisted of sorghum and beans and a few tomatoes.

Cultivation is obviously well understood and there is undoubtedly great potential for expanding the area under tillage and improving the methods of crop husbandry.

Hay is made for use in the dry season.

A visit by the Agricultural Officer should be made as soon as is practicable.

7. HUMAN POPULATION

There are many villages in the area. One officer reported that he had seen ten villages within easy walking distance of the position. Each village consisted of about a dozen dwellings. The normal population of the area was estimated at about 1000 people.

Some people lived in cave overhangs but most appeared to live in grass huts, which were surrounded by stone walls. One hut seen had a small garden attached, growing beans, sorghum and tomatoes. The people seemed to have more possessions than at "Chalk Pit" and gave the impression of following a more settled way of life.

The population seen consisted almost entirely of women and children, most of the men, it must be assumed, belonged to the Firqat or Adoo. The M.O. said that there was quite an appreciable amount of illness in the population.

The roofing of the huts is used for fodder during the dry season. Half the floor areas of the huts were covered with hay as a sleeping area. Open fireplaces were seen in most huts, a considerable fire hazard.

8. ANIMAL POPULATION

(a) Cattle

These appeared to be of good quality, and resembled Friesian or Ayrshire types. In one village five milking cows and 25 young heifers were seen, all well fed and healthy. Cattle are kept in grass caves built along the bases of the hillsides, one cave accommodating up to 30 head. Cattle are driven to water one day returning to the village next day and so on.

Cattle are kept under cover in the heat of the day, going out to graze when the temperature drops.

It was estimated that each village possessed about 50 cattle, making about 500 in the area surveyed.

The average value of a mature beast was put at £40-45.

A mature cow was slaughtered for food by the Firqat. The musculature and all organs were carefully inspected and appeared to be without blemish, the meat was of very good quality.

(b) Other Animals

No goats are kept in this area. A few donkeys and camels were seen and were of good quality and healthy.

9. SUMMARY

A much more settled area than "Chalk Pit". Again radical development is not desirable, nor, I would think, possible. However, general assistance is required to improve those factors already understood, i.e. livestock husbandry, simple agriculture, fooder conservation and, underpinning all this, improvement of water supplies.

10. ACTION REQUIRED

Exploratory well drilling should be undertaken as soon as is possible.

Improvement of the present methods of agriculture and fodder conservation should be investigated at an early date.

Veterinary aid should concentrate on investigation of prevalent diseases and nutritional deficiencies.

This is an area of very great agricultural potential and could be developed to the benefit of the local people and the national economy.

Salalah
19.10.71

Annex 'D' (cont.)

From Veterinary Officer

To Director of Development, DHOFAR

REPORT ON AERIAL SURVEY OF JEBEL CATTLE 18 NOVEMBER 71

Ref A: My memo, The Meat Trade dated 23.10.71

1. Aim To locate the main centres of cattle population and to estimate numbers.

2. Method Flying in a SOAF Beaver and noting previous SOAF reports of large herds, map squares were systematically observed through binoculars. Height was at about 4-5000 ft above the ground, ie about 8000 ft above sea level. Duration of flight 2 hours.

3. Area Surveyed

The following map squares were observed:

3090
3000
2090
2000
1090
1000
0000
9000

4. Observations

a. Cattle

(1) Area of very heavy concentration

Map refs 2996 and 2892, the area of the Darbat. This area had a particularly heavy concentration. It would be true to say that in places the ground was black with cattle and it was quite impossible to count them. However previous estimates by pilots of 2000 head would seem to me to be a very reasonable figure.

There is plenty of water in the area and quite a lot of green vegetation. A lot of animals were observed at water and the rest were grazing, no cattle appeared to be lying down. Many animals must have been obscured by the trees which grow along the Darbat.

Herds of several hundreds were seen along the whole length of the Darbat stretching down to the sea.

(2) Large Groups

These groups numbered up to 2-300 head and were seen at the following locations:

3686 - beyond Taqa
1687
9806
9506
9411
8907

One herd of about 150 head was seen being driven along the Midway road towards Midway.

Smaller groups of 10-50 head were seen dotted about over the whole area surveyed, all appeared to be grazing. Some water holes were seen and it must be assumed that there is water all over the area.

It was estimated that at least 5000 head were seen and that many more cattle may live in the area because quite large sections flown over were obscured by cloud.

All cattle seen appeared to be of the Friesian, or Ayrshire or Channel Island type. Obviously it was not possible to assess their condition but the 30 cattle I saw at "White City" on 14.11.71 were all in very good condition and it can be assumed that the other Jebel cattle are still in good condition, as food and water generally appeared to be adequate.

One large herd of goats was seen.

b. Agriculture The areas of cultivation seen, were much larger than I had observed hitherto. These were mainly on the lower reaches of the Jebel. Small enclosed plots were seen clustered about the villages. Beyond the villages, very large enclosed areas were seen, possibly 1-200 acres in extent. These had no habitation near them and the crops formed a patchwork pattern and are probably worked on a communal strip system.

All cultivated areas were enclosed with stout stone walls and the grass fires all seemed to have been stopped at the walls. A lot of the fields still appeared quite green in contrast to the surrounding open grazing land.

Conclusion

The statement that "the wealth of Dhofar lies in its cattle" is certainly borne out by this survey. Jack's estimate of 20,000 head on the Jebel would seem a very reasonable figure.

Eventually it should not be too difficult to move cattle from the Darbat and Taqa to Salalah. The potential for the production of ghee and meat can only be described as vast.

The possibility of developing a profitable meat industry for home consumption and export should be constantly kept in view.

My thanks are due to Flt. Lt. John Graves, SOAF who piloted me and who pointed out many features that I would otherwise have missed.

G.R. DURRANT
Captain RAVC

Salalah
19.11.71

Annex 'E'

VETERINARY ESTIMATES - 1972

Item		Estimated Cost
1.	Drugs	£2,500
2.	Laboratory Equipment	700
3.	Surgical instruments (balance of list presented Sep 71)	400
4.	Operating table	2,500
5.	Office furniture	200
6.	Veterinary publications	40
7.	Salaries of local personnel 7 @ £41 per month	3,401
8.	Hire of offices at Awqad, Dhariz, Taqa, Marbat, Sudh @ £10 per month	600
9.	Salary UK V.O. (Sultanate contribution)	2,200
10.	Salary Pakistan V.O.	1,800
	TOTAL	£14,341

Add on to this figure:

a. Cost of any further training schemes.

b. Vehicle expenses.

Annex 'F'

Veterinary Officer
Training Team
British Forces Post Office 66

G/JJJ/37

Director of Development DHOFAR
PO Box 5
SALALAH

28 November 1971

MEMO - PURCHASE OF CATTLE

1. 9 maiden heifers and 1 in-calf heifer were purchased at Khor-Beled this morning by the veterinary officer. Their average age was put at 2½ years.

2. Total cost of purchase was £700.

3. These animals are to be the foundation stock for the Government dairy herd.

4. The animals were driven along the beach to SALALAH and penned at the livestock farm at Bir bint Ahmed.

5. These animals have been short of food for several days and have been on a low plane of nutrition since the monsoon. They should be fed for some days on bullrush and dried sorghum. Later a little wilted incerne may be added to the ration and at a later stage still, a small amount of cake.

6. They will eventually be mated with the imported friesian bulls, but this should not occur for 8-12 months, depending on their growth rate.

7. All cattle at Bir bint Ahmed will be sprayed with gammetox and dosed with PTZ on the 29th of November 1971.

8. It was not feasible to test the new arrivals for tuberculosis, brucella or theilliria because of lack of isolation facilities. These tests will be carried out as soon as is practicable.

9. Arrangements are to be made to have all Government cattle numbered by means of ear tags.

G.R. DURRANT
Capt
RAVC

Copy to:
Assistant Director of Development
Mr. Basrah - for info
BATT - for info
File

BETTER MANAGEMENT OF CATTLE

By using better methods of management, cattle can be made to produce more milk, more meat and more calves. What do we mean by management ?

Management means giving the animal those things that will make it comfortable and healthy. By so doing we will also increase production and so have more food for our families and a higher income. The things we must give the cow are a continual supply of clean water, plenty of good food, and a well made house, which should be kept clean. All these things can be provided with very little extra effort, yet they are generally neglected in Dhofar. The result is that cattle in this country are often thin and unhealthy and give very little milk.

The first important requirement is a continual supply of clean water. Start a simple routine, check that your animals have a full bowl of water each morning and evening.

In the same way try to improve your methods of cattle feeding. Cattle in Dhofar generally receive food once or twice each day. It would be much better to give them several small feeds in the day, so that they never feel very hungry or at othertimes overfull. In this way cows are kept contented and are able to produce more milk.

New types of food are being introduced for feeding cattle and you may wish to try these with your own animals. Cabbages and turnips are two very useful crops for feeding to cattle. When cattle are given new foods they often reject them, because they are unfamiliar with them. In this they are like people who do the same thing. The best way to make cattle take these new foods is to starve them for twelve hours before offering the food. Turnips which are hard should be cut into small slices. Try putting the food between the cows lips, it will often accept it in this way. Similarly if a cow is sick and refuses to eat, press a few pieces of tender lacerne to its lips it will often start to eat again with this treatment.

Food should be presented in an attractive manner. Lacerne should be placed in racks, turnips and cabbages should be placed in troughs. The food will remain cleaner this way and waste avoided. The Development Department will give you advice on the construction of troughs and racks.

If you would like infomation on the growing of new crops such as cabbage and turnips the Agricultural Officer will be pleased to help you. These crops are also good foods for poultry and humans, particularly growing children.

Remember the main points in better cattle management are:

Constant water supply

Plenty of good food

Clean surroundings

A good animal house

The veterinary officer will advise you, free of charge, on any animal management problems. Why not try using better methods of cattle management the result will be healthier animals and more milk and meat.

Annex 'H'

Veterinary Officer
BFPO 66

A/SMB/37 .

Director of Development Dhofar
PO Box 5
Salalah

27th December 1971

REGISTRATION OF CATTLE IN DHOFAR

1. In order to bring about long term improvements in the level of cattle management in Dhofar, it will be necessary to start a Government Registration Scheme.

2. Such a scheme should aim at simplicity of operation and the minimum of of paper work.

3. The eventual benifits will be:

a. A better breed of cattle.

b. An improvement in the calving index.

c. Higher output of milk and meat.

d. More effective control of disease.

4. Using the registration book as a basis it will be possible to keep records of individual cows, whether owned by the Government or members of the public.

5. Cattle owned by the Government will be tagged in the right ear, privatly owned animals will be tagged in the left ear.

6. The ten Jebali heifers purchased on 28th November 1971 were tagged on 22nd December 1971. The form of registration is shown at Appendix A.

7. The prefix selected was D.D.D. and Government cattle will be numbered 1 - 50 initially. Privately owned animals will be numbered 51 - 100 and entered in a separate register. Other prefixes and combinations of numbers may be selected in future as necessary.

8. Tags and tagging forceps were obtained from Arnolds Ltd, Reading, UK.

9. It is hoped that progeny obtained from the mating of the Friesian bulls will be registered by the general public. The farm foreman has lists of all cows mated to these bulls with expected dates of parturition. PSY OPS will broadcast an appeal to the public to bring these calves forward for registration and will explain the benifits of the scheme to farmers.

2.....

10. When tagging immature beasts, a margin should be allowed for growth of the ear.

G R DURRANT
Maj RAVC
V.O. BATT

Copy to:

Asst Director of Development
Mr Basrah
BATT - Action para 9 please.
PSY OPS
File

Appendix A to A/SMB/37 dtd 29 Dec 71

REGISTRATION OF CATTLE IN DHOFAR

Prefix and Number	Name	Date of Purchase	Date of Birth	Tagged	Remarks
DDD 1	ETHEER	28-11-71	June 1969	22-12-71	
DDD 2	KARIAN	28-11-71	June 1969	22-12-71	
DDD 3	SHIRA	28-11-71	June 1969	22-12-71	
DDD 4	HASSAUN	28-11-71	June 1969	22-12-71	
DDD 5	ELGAN	28-11-71	June 1969	22-12-71	
DDD 6	KESN	28-11-71	June 1969	22-12-71	
DDD 7	ADAR	28-11-71	June 1969	22-12-71	
DDD 8	HESSON	28-11-71	June 1969	22-12-71	
DDD 9	ASHIF	28-11-71	June 1969	22-12-71	
DDD 10	BAIHAMF	28-11-71	June 1969	22-12-71	

Annex 'E'

Training Team
BFPO 66

IMPORTATION OF LIVESTOCK FROM SOMALILAND

Reference: A. Memo The Meat Trade 23. 10. 71.

1. DETAILS OF IMPORTATION

a. Two Dhows docked at Raysut on 28.12.71. Each dhow carried,

500 Sheep
200 Goats
47 Bullocks

The voyage from Somaliland normally takes four days but storms delayed their passage and they were seven days at sea.

b. The animals were seen as they were brought on shore and all appeared healthy and fat and none the worse for their travels.

c. The dhows return empty to Somaliland. Perhaps there might eventually be scope for exporting such products as coconuts, ghee or vegetables from Dhofar on the return voyage. The market for such products in Somaliland would require investigation.

2. BREEDS OF ANIMALS

a. Cattle These comprised four bulls and ninety steers. They were all of the zebu Boran type. They were large well made animals of European size and good quality. Perhaps the bulls might be useful for breeding. Almost certainly their progeny would be more adaptable and disease resistant than the progeny of imported friesians.

b. Sheep These were Somali Fat Tailed, almost identical with the Black Headed Persian breed. They appeared to be in good condition and were much bigger than the local Hejazi type.

c. Goats These were large framed and in good condition. They appeared to be of the Sudan Desert breed.

3. UNLOADING OF ANIMALS

a. The goats and sheep were manhandled into rowing boats and brought ashore twenty or thirty at a time.

b. The steers were pushed overboard and swam the 500 yards to the shore, the stockmen riding on their backs. They were then immediately driven on foot 10 miles to grazing grounds at Salalah. No exhaustion or losses were reported!

4. CONDITIONS AND MANAGEMENT ON BOARD.

a. When the ship was unloaded the Veterinary Officer examined conditions on board. These at first sight appeared extremely crude. Animals were kept

...../2

below deck with very little overhead space. However although covered in, ventilation was very good because of the open hatches and side ventilators.

b. Adequate water and good quality hay were fed to the animals on the voyage.

c. No losses or ill health occurred during or after the voyage! All animals seen by the VO appeared well fed and healthy.

d. At first sight one might have predicted heavy losses through 'Shipping' Fever' and allied conditions, as an inevitable result of transporting animals in such croweded conditions, for seven days at sea. Blood and Henderson report a high incidence of 'Shipping Fever' in N America and Europe but a low one in Australasia, perhaps this low incidence also applies here as well.

e. The lack of losses must certainly be due largely to the following factors

1. Good ventilation on board
2. Favourable climatic conditions
3. Skilled stockmanship of the sailors.
4. Hardy metabolism of the stock transported

f. As a result of examining these animals and the dhow, my statement at para 5 (a) of Ref A might need to be revised. However the metabolism of Dhofari animals under such conditions has not been studied and little is known of the level of stockmanship of the sailors who might transport them. These two factors would be crucial when planning any future export enterprize from the province.

5. FUTURE IMPORTATIONS

a. The agents Said Sharfari and Co intend to import 600 steers and 6000 sheep and goats from Somaliland before the next monsoon.

b. Some of the animals will be grazed and slaughtered during the period of the monsoon It will be interesting to see if they maintain their condition in Dhofar

c. When future shiploads are brought to Rayzut they should be examined by the VO, the Asst Director of Development and the Agricultural Officer.

6. COSTS

a. The total amount paid for the consignment by the agents was about £20,000. Steers were priced at £75 - 90 Sheep and goats £9.

b. The above figures compare very favourably with prices paid in Dhofar by the agents. Cattle, of poor quality - £45 Sheep and goats of very poor quality - £10.

c. Mr Cavey of Taylor Woodrow told me that last week he had killed five cattle, total dressed weight amounting to 850 lbs This is a particularly low KOP and the KOP of the imported animals could confidently be predicted as being very much higher.

7. FUTURE INVESTIGATIONS

a. Veterinary officers in the future might find it interesting to study

..... :/3

livestock importations. Little is known of animal disease and stress caused by transportation to and from Dhofar. The metabolism of Dhofari cattle under these conditions is not known. However cattle driven down from the Jebel showed no distress as a result of their exertions.

b. The danger of importing foot and mouth disease, anthrax and rinderport should be borne in mind. Information on animal diseases might be obtainable from the Somali Veterinary Department.

Refs: SHIPPING FEVER OR PNEUMONIC PASTEURELLOSIS

1. Merck Veterinary Manual 3rd ed p 426.

2. Hagen's Infections Diseases of Domestic Animals 5th Ed p 255 p 982.

3. Veterinary Bacteriology and Virology, Merchant and Packer. 7th Ed p 340 p 668.

4. Veterinary Medicine, Blood and Henderson 3rd Ed p 361 p 508.

STRESS

1. Veterinary Medicine, Blood and Henderson 3rd Ed p 35.

2. Duke's Physiology of Domestic Animals 8th Ed p 1078.

GR DURRANT
Major RAVC
V.O. BATT

SALALAH 31.12.71.

Veterinary Officer
British Forces Post Office 66

7th January 1972

Asst Director of Development
Dofar
PO Box
Salalah

IMPORTATION OF SHEEP AND GOATS FROM SOMALILAND 6 JAN 72

Reference A. My memo Importation of livestock from Somaliland, dated 31 Dec 71.

1. Details of Importation

At the request of the Customs Branch I boarded an Iranian Dhow at Rayzut at 1100 hrs on 6 Jan 72.

The vessel was carrying a cargo of 570 goats and sheep from Somaliland

2. Conditions on board

a. The ship had been six days at sea, but conditions underfoot were clean and dry.

b. The sheep were Somali Fat Tailed and were mainly on the upper dock. The goats, of the Sudan Desert type, were mainly on the lower deck.

c. The animals were packed like sardines but all appeared well fed and healthy. No losses on the voyage were reported.

d. After inspection they were landed by lighter 60 at a time and removed in trucks by the contractors

3. Costs

Price per head averaged £9 a very reasonable figure.

4. Future Export/Import possibilities

The master informed me that he did a trade run calling at Rayzut, Somaliland Mombassa and Iran.

5. Record of Importations

It is strongly suggested that a careful record of numbers and origin of importations of livestock be kept, by the development Department. This would be of value in future economic development planning and could be important from the point of view of disease control.

GR DURRANT
Major
RAVC

Veterinary Officer
British Forces Post Office

Director of Development
Dhofar
PO Box 5
Salalah

// January 1972

ARABIC TRANSLATIONS OF FARMING PAMPHLETS

1. Attached are the Arabic translations of the following pamplets.

   a. How to Improve Your Farming Methods.

   b. Better Cattle Management.

   c. Better Poultry Keeping.

   d. The Production and Utilisation of Coconuts.

2. Local people have suggested that short excerpts, of say five minutes, be broadcast each day and the process repeated continually.

3. Similar methods are used in Malaya and Singapore and I am sure this approach of short sharp repetitive talks is the most effective.

4. I will approach PSYOPS and the medical officer and ask them to produce similar talks on hygiene and nutrition.

5. Human and animal malnutrition and bad hygiene in Dhofar, as in many other countries, are in fact caused not by real poverty but by ignorance and only propaganda will overcome this.

6. The growing of more vegetables, a simple task, here, will certainly do much to overcome the wide incidence of human and animal malnutrition.

7. The production of more eggs and poultry is a most important factor and Radio Salalah should place great emphasis on these subjects.

GR DURRANT
Major
RAVC

Copy to: BATT
PSYOPS
MO BATT
Agricultural Officer

NOTES ON THE USE OF ARNOLDS HOOF INSTRUMENTS

1. Instruments used

HQ SAF obtained a set of hoof instruments from Arnolds Ltd in December 1971. This comprised the Single-handed Hoof Cutter and hoof knives. The hoof knives consisted of a single metal handle and six interchangable blades all contained in a leather zip-up case.

2. Use on donkeys

a. Donkeys of the Animal Transport Squadron of the Sultan's Armed Forces are never shod. The feet become particularly hard and dressing with an ordinary hoof knife and farrier's rasp is often almost impossible. Many donkeys feet were observed to be in a neglected condition.

b. Trimming these neglected feet using the hoof cutter and knives proved to be a quick and simple operation. It must be admitted that two hands were necessary when using the hoof cutter on the worst cases.

c. Treatment of one particular donkey, alone justified the purchase of this equipment. This animal was returned to HQ Dhofar from its sub-unit, with the recommendation that it be cast from the service, because it was unable to walk and could barely stand. The front feet were so badly overgrown that the animal was only able to remain upright by resting on the bulbs of the heels. It was suspected that permanent displacement of the pedal bone may have occurred, as the animal had been in this condition for nearly twelve months. As the donkey was to be cast it was decided to attempt radical treatment.

Using the hoof cutter $2\frac{1}{2}$" of hoof wall and sole were removed. Final trimming with the hoof knives was then carried out and a rudimentary frog was exposed and reshaped. The frog was not however pared.

d. The animal was somewhat unsteady on its feet as it was unfamiliar with this new "normal" position, however there was no tenderness or pain in the feet.

Within five days the animal was trotting up sound and back in full work.

e. SAF maintains 85 donkeys on strength and is to purchase six sets of these instruments for issue to sub-units.

3. Other Animals

Cattle, goats and sheep kept on the sandy areas of the plain in Dhofar, frequently suffer from overgrown feet, which restricts their ability to move about in search of grazing.

Many cases of all three species were treated with complete success using the instruments. In the case of goats and sheep great care must be exercised to avoid cutting the quick.

One particularly bad case was a cow with grossly overgrown feet, which could only walk with difficulty. The animal was cast by Reuff's Method, although excitable, no tranquilliser was required. Radical trimming and reshaping of all four feet was carried out, using the instruments and the animal was able to walk immediately without difficulty. In a fairly considerable experience of treating bovine feet, I found this case one of the simplest I have dealt with. Department of Development, Dhofar is to purchase a set of these instruments.

4. Conclusion

The Arnolds Single-handed Hoof Cutter and set of hoof knives are very efficient instruments and would be most useful items in the veterinary officers equine chest.

G R DURRANT
Major RAVC
VC BATT

Salalah
19 December 1971

Veterinary Officer
BFP. 66

Director of Development Dhofar
PO Box 5
Salalah

6 January 1972

VISIT TO SUDH AND MARBAT 4 JAN 72

Reference A. Veterinary Report dated 1 Oct 71 Sections 2 and 3.

1. Aim
To obtain veterinary trainees from Sudh and Marbat.

2. Sudh - Medical and Veterinary Situation

a. As on my previous visit to Sudh 15 Sep 71 a considerable number of people were presented for medical treatment.

b. Very few medical drugs were available but eye ointment and paludrine were dispensed.

c. The Wali of Sudh (whom I interviewed at Marbat) informed me that BATT had done very good medical work there and left him with a large supply of medical drugs, which he kept under lock and key. The Wali himself was ignorent of dispensing and the need for a medical assistant is pressing.

The Wali said he did not feel that it would be justifiable to appoint a veterinary trainee before a medical one. I fully agreed with this view and probably a veterinary assistant as such would not be fully occupied.

I suggested to the Wali that if he could obtain a suitable man that he could be trained in both medical and veterinary dispensing. The veterinary department would train this man in animal work at Salalah and he could also receive instruction at the civilian hospital and from the RAMC. The Wali agreed that this would be the best solution and said he would try to obtain a suitable recruit.

d. This matter should be pressed until a suitable trainee is obtained, the need for simple medical aid in this location is most urgent. The need for veterinary aid is perhaps less pressing but would certainly have a good 'hearts and minds' effect.

3. Marbat

a. This location was last visited by me on 26 Sep 71. The Wali on that occasion promised to look for a suitable man as a veterinary trainee. So far one has not been nominated.

b. The Wali said he would make enquiries again. BATT reps at Marbat said they would continue to press the Walis of Marbat and Sudh to send suitable trainees.

c. The Wali of Marbat informed me he now had one man suitable for training as an engineer.

G R DURRANT
Major
RAVC

Copy to: BATT
Capt Jarvis

Veterinary Officer
BFPO 66

A/SMB/37

Director of Development, Dhofar
PO Box 5 Salalah

5 January 1972

LIVESTOCK KEEPING COMPETITION

1. The Arabic translations of the farming pamphlets are now being distributed and their contents broadcast on Radio Salalah. The children at Salalah School will receive indoctrination over the next two months by means of pamphlets and demonstrations at the Livestock Centre.

2. In order to stimulate people to put these newly acquired ideas into practice it is suggested that a livestock keeping competition be held in Salalah and district every three months.

3. The competition would be to select the best kept animals and farmsteads. As well as the quality and condition of the animals themselves, marks would also be given for the cleanliness of premises and the adoption of a good animal husbandry routine.

4. The competition could be judged by the VO. Mr Butler and Mr Basrah. The first prize might be a transistor radio with several consolation prizes. Psy Ops would publicise the scheme and the conditions of entry. The latter would be made very simple.

5. It is understood that these competitions are frequently held in India and Pakistan, where they have been very successful. It is suggested that they should be initiated in Dhofar.

G R DURRANT
Maj RAVC
BATT

Copy to: BATT
Psy Ops

Veterinary Officer
BFPO 66

Asst Director of Developement Dhofar
PO Box 5
Salalah

5 Jan 1972

ANIMAL HUSBANDRY AT BIR BINT AHMED

Ref.A Memeo - Purchase of Cattle dated 28.11.71
B Memo - Stock feeding at Bir Bint Ahmed dated 27.12.71.
C Pamphlet - Better Cattle Management Dec 1971.

1. DEHORNING

A. In view of the death of an adult cow and the laming of another through horn injuries, it is strongly advised that all adult animals be dehorned.
This should be carried out under L.A. using an embryotomy wire. The wounds should be seared with a hot iron and dressed with Corexane Cream to prevent fly strike.

B. The Jebeli heifers should be dehorned in a similar fashion when horn growth is mature.

C. When calves start to be reared at the Live stock Centre they should be de-Budded under L.A. This should not be carried out until they are well grown and strong enough to withstand the stress involved. It should be done how ever before the horn buds grow through.

D. An electric debudder can be obtained from Arnold's Ltd. At the same time it would be a good idea to obtain plain disbudding irons which can be heated in the fire, for use where there is no electricity or should the disbudding machine break down. The use of caustic soda for debudding is not recommened

2. NUTRITION

2. A. The Jebeli heifers purchased in November can not be said to be "doing". Although not sick their growth rate is disappointing.

B. The quantity and variety of food should be increased. They should receive several feeds in the day not just the present one, or if they are lucky, two. (see refs B and C).

C. Although regular spraying with Gammatox for ticks and dosing with PTZ for worms, is carried out, an increase in the plane of nutrition is the most important factor needed to ensure quicker rate of growth. Full feed racks at night would be the best solution TO THIS PROBLEM.

3. DISEASE CONTROL

A. The practice of mixing mature cattle with young growing stock is never to be recommended. It leads to bullying of the young animals and their crowding out at feeding time.

B. Another serious drawback is the danger of spreading parasites and disease. At Bir Bint Ahmed some of the older cattle give all the signs of clinical Tuberculosis. They are almost certainly chronic carriers of brucellosis.

C. The present system of mixing will probably ensure that the foundation stock for the government herd will also be carriers of these conditions. This will make the establishment of a"clean"herd a very protracted matter.

D. It is realised that accomodation is a problem, but the older cattle should be seperated from the young stock as soon as possible, in the interest of diseasecontrol and better growth rate of the latter.

E. Testing the young animals for T.B., brucella, theilliria will only become a realistic policy when suitable replacements can be found, should reactors be discovered. This will not be possible for some considerab le time.

4. RESTRAINT OF ANIMALS

A. At present, restraint of animals at the Livestock Centre is a difficult and hazardous procedure. The construction of a simple temporary wooden crush and collecting pen would considerably simplify matters.

B. Rope halters should be made or purchased for handing individual animals.

C. Bull poles and chains should be purchased for leading the Friesian bulls, if serious accidents are to be avoided.

G R DURRANT
Major RAVC.

TASKS CARRIED OUT BY RAVC OFFICERS IN DHOFAR

1. The development of the livestock industry by

   a. Assessment of the situation, followed by

   b. Improvement of husbandry methods by education and extension schemes.

2. Direct treatment of civilian farm animals.

3. The training of local civilians as veterinary assistants.

4. Advice on hygiene and water supplies.

5. Co-operation with the civilian and military medical authorities in the investigation and control of the zoonoses.

6. Meat and food inspection.

7. Port inspection of imported live animals.

8. Inspection and advice concerning military guard dogs.

9. Advice on and treatment of Army pack transport animals.

10. Supervision of movement of pack and food animals by land, sea and air.

11. Examination of animals thought to be carrying information to the enemy.

12. Advice on the development of slaughter houses and dairy farms.

13. Advice to the civil and military authorities on pest control. eg wild dogs, leopards, rats and insects.

14. Advice on and treatment of domestic pets and unit mascots.

Report on the Cattle Breeding Programme, Dhofar, using the Imported Friesian Bulls - February 1972.

1. The Crossbreeding Programme.

The three imported Friesian bulls commenced serving local cattle in May 1971.

Examination of these cows commenced in January 1972. Earlier examinations were not carried out because of the small number of cattle involved. Only by examining a group of cattle from the third month of pregnancy to term could any sort of picture be drawn.

A total of 57 cows were served between May 1971 and January 1972.

2. Basic requirements and the present state of knowledge.

When considering a breeding programme in any species, certain basic physiological information should be available. In the case of dairy cattle, some of the most important of these are as follows:

a. Dam

i. Age of first oestrus.
ii. Periodicity of oestrus.
iii. Length of oestrus.
iv. Manifestation of oestrus, whether obvious or "silent".
v. Optimum age for first service.
vi. Average numbers of matings per conception in the herd and group.
vii. Ratio of live births to conception rate.
viii. Calving index.
ix. Length of lactation.
x. Effect of lactation on conception.
xi. Average numbers of calves to be produced in the life of a breeding cow.
xii. Effect of crossbreeding on incidence of dystokia.

b. Sire.

i. Ratio of matings to conception.
ii. Number of cows which are to be served per bull.
iii. Length of useful working life.
iv. Prepotency of sire.
v. Effect of environment on fertility and length of working life.

b. Progeny.

i. Manifestation and maintenance of hybrid vigour.
ii. Effect on level of disease resistance.

None of the above facts are known in Dhofar, though certain of them can be guessed at.

Dhofar cattle are animals of the Oksh breed (Synonyms, Arab Bedouin, Chaissi Kleiti). Age of first oestrus varies from 2-3 years. Periodicity of oestrus is unknown but is almost certainly affected by the monsoon and hence level of nutritional environment and other factors such as temperature.

.../2

"Silent heat" may well occur but is not likely to be detected because of the practice of tethering cattle and restricting the movement of bulls.

On the very limited evidence available conception rate would appear to be fairly good. This may be related to the very low rate of milk production prevailing in cattle in the province.

Many other factors will only be discovered as the programme proceeds.

It will be seen that a successful crossbreeding programme, presupposes the possession of a considerable amount of statistical information, which must be obtained from a large population. Even where such information is available disadvantages may not at first become apparent, witness the difficulties (particularly dystokia) which were experienced in UK where Charollois bulls were introduced only after careful consideration of all the likely factors. This trial was carried out on a very wide scale in an advanced economy, where environmental factors were under complete control. Here there is no control at all over the environmental factors.

3. Preliminary findings

Cattle were examined systematically starting with those served in May 1971. Cattle served after 1st November 1971, were not examined because accurate manual pregnancy diagnosis is not possible before the completion of the third month of gestation.

Examination was per rectum, a procedure which is not carried out by the plain farmers themselves. It is thought that the Jebali understand this technique and sometimes practice it. The location of cows was a most laborious matter involving journies to and from houses and gardens, often only to find an animal had been moved to another garden. On some occasions it took up to two hours to locate and examine one cow. If the programme were expanded to effectively utilise the three bulls, it could absorb almost the whole time of one veterinary officer.

No cases of pyometra or metritis have been seen in cattle in the province. Cattle which did not conceive appeared physiologically normal. It is interesting to note that no cases of cystic ovaries were detected, possibly this condition only occurs in high yielders wherephysiological stress is often thought to be a cause of infertility. Infertility here is much more likely to be caused by the more "natural" condition of poor nutrition. The fact that a high proportion of cattle were served in July may have been due to the effects of the publicity compaign or perhaps a higher incidence of oestrus due to the monsoon.

Farmers were generally found to be quite ignorant of the basic points of cattle breeding. Only one cow was brought back for a second service. Farmers work entirely on traditional knowledge handed down from father to son. The fact that some cows were slaughtered and others later put to local bulls indicates that they completely failed to understand the point of the programme. Years of education will be necessary before this ignorance can be overcome.

4. Summary of Findings (See Annex 'A')

No of bulls used	3
No of cows served May 71 - 1st Nov 71	48
No of matings per bull per month	2.66
No of cows slaughtered	12

..../3

No of cows barren	19
No of cows put to another bull	4
No of cows served twice	1
No of cases followed up	48
No of cows pregnant	22
% of cows holding to service	45.8 %

5. Comments on the findings.

The small number of animals involved in the programme so far makes the drawing of any definite conclusions impossible. However certain points are worthy of note.

a. The bulls are obviously underworked.

b. Their fertility would appear to be fairly satisfactory, though after a longer period in this environment and with more work, this might well decline.

c. The fact that some cows were slaughtered or put to other bulls was most disappointing.

d. No evidence of reproductive disease was seen, though with such small numbers this was probably not significant.

e. Cows slaughtered were obviously killed for celebration of religious festivals at the end of Ramadan and Eid in January.

f. Anoestrus was probably due entirely to malnutrition. the only cure for this is better feeding. Hormone injections would have no therapeutic application in this situation.

6. Modification of the programme.

If the programme is to be continued in the future the following changes should be implemented immediately:

a. A register recording all matings should be kept. This should be the responsibility of the Department of Development and the Veterinary Officer. The present booking system, maintained by the farm foreman is quite inadequate.

b. Cattle should be examined from the fourth month until term by the veterinary officer.

c. The bulls should be subjected to regular semen tests. This will not be possible until a laboratory is established.

d. Farmers should be encouraged to join the scheme by payment of a subsidy on live calves produced.

e. An intensive propaganda and education programme should be launched to instruct farmers in the benefits of better breeding.

In particular they should be told that cows served by the bulls should not be slaughtered unless found to be permanently barren.

Where cows return to oestrus they should be brought back to the centre that day and not put to other bulls.

f. Future breeding policy should be formulated. The decision must be taken whether to mate progeny with indigenous bulls or whether to continue mating with exotic stock. If the latter is decided upon,

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further importations will be required in two years time.

7. Crossbreeding and the Environmental Situation in Dhofar

Many crossbreeding experiments have been attempted in the tropics and the majority have failed because of inadequate disease control, lack of suitable nutritional environment and use of inadequate numbers.

Where crossbreeding has been successfuly introduced in the tropicsit has invariably been accompanied by a modification of environmental conditions and a very great improvement in husbandry practices.

Breeding programmes for cattle in the tropics need to be related not only to the prevailing state of husbandry in the area, but also towhat seems likely to be the state of husbandry in that area in the near future.

Jack 1955 suggested crossbreeding might be possible in certain circumstances in Dhofar. He recommended trials using Bos Indicus or Bos Bibos not the exotic Bos Taurus a fundamentally different matter.

It took European farmers in Kenya thirty years to successfully produce crossbred cattle. This was only possible after environmental factors had been brought under control by intense effort. Now that more scientific information is available it might be possible to control these factors in Dhofar in say 10 - 15 years time.

To attempt to improve an animal population by the complex and sophisticated technique of introducing new genes is a difficult undertaking even in advanced economies. It cannot be overemphasised that ther is no short cut to livestock improvement.

Any improvement in livestock in Dhofar will be a long term project. A much more profitable and effective, though less spectacular approach, will be to improve diet and husbandry. Major efforts should be directed to this end.

There is no evidence to indicate that experiments which have failed in so many tropical countries will succeed in Dhofar where all the limiting conditions are particularly predominent and will remain so for some years.

8. Recommendations.

a. Recommendations for the future of the Friesian bulls have been made by me in my Review of the Veterinary Development Programme, Dhofar March 1972, pages 8 and 9.

To recapitulate, while accepting that the importation of these animals had a very important psychological value in the "Hearts and Minds" campaign, it is is strongly recommended that they be phased out as quickly and discretly as possible.

To continue the scheme will only compound the error and result in the dissipation of funds which could be more usefully employed elsewhere.

b. Those crossbred calves that are produced should be registered as recommended, under the Cattle Registration Scheme. Their performance should be carefully observed and recorded.

..../5

c. Any future crossbreeding schemes should only be undertaken after most careful consideration of all the factors involved. Outside opinion should be obtained and the Middle East Agricultural Development Bureau in Bierut should be consulted.

Refs :

Payne. W. J. A. Cattle Production in the Tropics 1st Ed. Vol I Breeds and Breeding, Chs 6 and 7.

Williamson and Payne: Animal Husbandry in the Tropics 2nd Ed page 114.

Mahadevan. Breeding for Milk Production in Tropical Cattle. Chs. IX and X.

Salalh. February 1972.

G. R. DURRANT
Major RAVC

Cows' agony

SIR—Prof W. Holmes of Wye College is to be congratulated on his report to the Ministry of Agriculture on the danger of crossing Ayrshire cows with the larger Simmental bulls from Switzerland—danger that the calves will be lost at birth.

I fear that only the economic aspect of this will be considered, but should not the agony of the cows, labouring to drop calves of a size abnormal for their breed, be taken into account? A cow's labour is not easy normally; must it be made harder?

GWENDOLEN BARTER
Broadstairs, Kent.

Telegraph
28-11-72

Annex 'A'

Report on Cattle Breeding Programme. Details of individual examinations

Serial	Owner	Cow served	Expected partn date	Examined	Finding	Remarks
(a)	(b)	(c)	(d)	(e)	(f)	(g)
1.	Said Musalam Deri	June 1971	March 1972	-	Slaughtered for meat Nov 1971	Apparently not pregnant
2.	Salem Rydan	May 1971	Feb 1972	22.1.72	Not pregnant	Did not show subsequent oestrus.
3.	Braik kun bin Fat	May 1971	Feb 1972	-	Slaughtered for meat "some time ago"	Apparently not pregnant.
4.	Hawa bin Said Nawbi	May 1971	Feb 1972	23.1.72	Pregnant	Normal
5.	Bait el Wali	June 1971	March 1972	23.1.72	Not pregnant	Did not show subsequent oestrus.
6.	Yacud Awer	June 1971	March 1972	-	Slaughtered for meat Nov 1971	Apparently not pregnant.
7.	Said bin Adbul Aziz	June 1971	March 1972	23.1.72	Pregnant (by another bull)	Returned to oestrus Aug 1971 and served by privately owned bull.
8.	Malasm Ginan	May 1971	Feb 1972	23.1.72	Pregnant	Normal
9.	Said Sail Katim	June 1971	March 1972	24.1.72	Pregnant (by another bull)	Returned to oestrus Sept 1971 and served by privately owned bull.
10.	Salem Ramazan el Khot	June 1971	March 1972	-	Slaughtered Sept 1971	Apparently not pregnant.

.../2

(a)	(b)	(c)	(d)	(e)	(f)	(g)
11.	Ahmed Awad Hafiz	July 1971	April 1972	24.1.72	Pregnant	Normal
12.	Hashima Fergna	July 1971 Oct 1971	July 1972	24.1.72	Probably Pregnant	Normal
13.	Hassan bin Said	July 1971	April 1972	24.1.72	Pregnant	Normal
14.	Namabin Saingor Mutran	July 1971	April 1972	25.1.72	Not pregnant	Grossly emaciated.
15.	Ali Salem Turk	July 1971	April 1971	-	Slaughtered for meat because sick	VO not called. Possibly pregnant
16.	Abdullah Hassan Mohandns	July 1971	April 1972	25.1.72	Pregnant	Normal
17.	Masser Moaammed	July 1971	April 1972	25.1.72	Pregnant (by another bull)	Returned to oestrus and served by a privately owned bull. Date not known
18.	Hadid bin Said Hadid	July 1971	April 1972	25.1.72	Pregnant	Normal
19.	Fadal Alawi	July 1971	April 1972	25.172	Pregnant	Normal
20.	Fadal Alawi	July 1971	April 1972	25.1.72	Pregnant	Normal
21.	Fat Ala Rabeer	July 1971	April 1972	25.1.72	Pregnant	Normal
22.	Abdul Sheik	July 1971	April 1972	25.1.72	Pregnant	Normal

..../3

(a)	(b)	(c)	(d)	(e)	(f)	(g)
23.	Farah Rokub	July 1971	April 1972	25.1.72	Pregnant	Normal
24.	Gensherore	Aug 1971	April 1972	31.1.72	Pregnant	Normal
25.	Abdul Asamed	July 1971	March 1972	-	Killed for meat Nov 1971	Apparently not pregnant
26.	El Baz	Aug 1971	April 1972	31.1.72	Pregnant	Normal
27.	Harif	July 1971	March 1972	31.1.72	Not pregnant	No subsequent oestrus.
28.	Abdulla Sala Mahun	Aug 1971	May 1972	25.1.72	Pregnant	Normal
29.	Fatima Sail	Aug 1971	April 1972	-	Killed for meat Nov 1971	Apparently not pregnant
30.	Gebran Sibti	July 1971	March 1972	31.1.72	Pregnant	Normal
31.	Gebran Sibti	July 1971	April 1972	Seen 31.1.72	Calved 31.1.72	Calf by another bull. Total confusion here. Thought it may have been to Friesian bull. Illustrates point of para 6 (a).
32.	Abara Din	July 1971	March 1972	-	Killed for meat Nov 1971	Apparently not pregnant.
33.	Ali bin Saif	Aug 1971	April 1972	31.1.72	Not pregnant	No subsequent oestrus.
34.	Salem Hamid	Aug 1971	April 1972	31.1.72	Not pregnant	No subsequent oestrus.
35.	Mohd Aydrus	Aug 1971	April 1972	-	Slaughtered for meat Jan 1972	Not pregnant

..../4

(a)	(b)	(c)	(d)	(e)	(f)	(g)
36.	Ali bin Salem	Aug 1971	April 1972	-	Slaughtered for meat Jan 1972	Not pregnant
37.	Omar Said	Sept 1971	May 1972	31.1.72	Pregnant	Normal
38.	Omar Said	Sept 1971	May 1972	31.1.72	Pregnant	Normal
39.	Said bin Giman	Aug 1971	April 1972	31.1.72	Pregnant(by a private bull).	Returned to oestrus date unknown.
40.	Awr Goher	Aug 1971	April 1972	31.1.72	Not pregnant	No subsequent oestrus
41.	Awr Kelali	Sept 1971	May 1972	31.1.72	Pregnant	Normal
42.	Mohd Awr Shanfri	Sept 1971	May 1972	31.1.72	Pregnant	Normal
43.	Shatha Hamis	Aug 1971	April 1972	1.2.72	Pregnant	Normal
44.	Awa Hafil	Sept 1971	May 1972	-	Slaughtered for meat Jan 1972	Not pregnant
45.	Akid Ibrahim	Oct 1971	June 1972	1.2.72	Not pregnant	No subsequent oestrus
46.	Awa Haj	Oct 1971	June 1972	-	Slaughtered for meat Jan 1972	Not pregnant
47.	Regeb Kolkoa	Sept 1971	May 1972	1.2.72	Pregnant	Normal
48.	Garma Adem	Sept 1971	May 1972	1.2.72	Pregnant	Normal

Veterinary Officer
BFPO 66

A/SMB/37

HQ Sultan's Armed Forces
Bait Al Falage
Muscat
Sultanate of Oman

12th February 1972

VISIT TO MUSCAT 3-2-72 TO 9-2-72

Reference: A. Veterinary Development Programme-Dhofar, Review, March 72.
B. Inspection Reports SAF donkeys, HQ Dhofar.

1. At the request of HQ SAF I visited Muscat on the above dates.

2. On 6th February I called on the Senior Medical Officer SAF and the Minister of Economy at Muscat.

3. On 7th February I visited Nizwa and investigated a reported outbreak of "liver rot" in goats. I examined horses and transport donkeys at HQ The Muscat Regiment.

4. On 8th February I called at the British Embassy and discussed livestrock development with Mr J. Shipman. I then called on the Government VO at the Ministry of Economy and outlined my observations made at Nizwa and discussed methods of obtaining veterinary drugs and equipment.

5. Further details of the visit are attached at Annex 'A'.

GR DURRANT
Major RAVC
VO BATT

Copy to:

HQ DHOFAR
The Muscat Regiment
BATT
Director of Development, Dhofar
J.G.T. Shipman Esq. British Embassy Muscat
Director General, Ministry of Economy Muscat
Major T. Landon SAF
Capt D. Brunton SAF

VETERINARY REPORT, VISIT TO MUSCAT 3-9 FEB 72

Aim

To give veterinary advice on the subjects discussed in the following paragraphs.

1. Animal Husbandry and Veterinary Services

a. It is understood that the following animals are kept in Muscat:

Cattle Sheep Goats Camels Donkeys Horses Poultry

Quite a large number of expatriate families keep domestic pets and advice on these was given to some owners.

b. Although it was not possible to make any surveys or detailed investigations it would appear that the keeping of animals plays an important part in the lives of many of the people.

c. It would probably be correct to state that the level of livestock husbandry is extremely low.

d. An Indian trained veterinary surgeon has just been appointed to work for the Sultanate Government.

Until I was informed of this fact by the Minister of Economy I was quite unaware that any such appointment had been made, as was everyone else to whom I had spoken previously.

The Minister introduced the new VO to me and a short discussion followed between the Minister the VO and myself.

Recommendations

(1) Without in any way wishing to encroach on the area of responsibility of the new VO, it is suggested that consideration should be given to the initiation of a livestock development programme similar to that which has commenced in Dhofar (See Ref A).

(2) Over a number of years, this could lead to a raising of the level of livestock output, with a consequent gain to the national economy and an increase in the standard of living and health of the people.

2. Epidemic of Caprine Liver Rot - Nizwa

a. Very large numbers of goats in the area of Nizwa have been reported to have died during the past four weeks. Farmers described them as suffering from "liver rot". A similar epidemic was said to have occurred two years ago.

b. It might be significant that the outbreak was coincidental with the recent heavy falls of rain which are most unusual in this country. However it was observed that the area is well supplied with falages which flow with water at all times of the year. Numerous patches of marshy ground were seen and these were said never to fully dry out.

This disease has not been seen by me in Dhofar, but it could well occur, particularly on the lower Jebel, during and after the monsoon.

...../2

c. A post mortem examination was carried out on a goat which had just died, the cause according to its owner being "liver rot".

The liver had a pitted appearence in section which would be consistent with heavy infection by Fasciola Hepatica. The surface had a typical greenish yellow necrotic appearence. The parenchyma was extremley friable and could be squeezed through the fingers.

A faeces sample was taken and on microscopic examination, eggs of Fasciola Hepatica were seen.

f. This single instance cannot of course be taken as conclusive evidence of the cause of the epidemic. However all the circumstances would point to liver fluke as being the agent of disease, but further investigations would be requird to confirm this.

g. I should like to thank Major E. Taylor, SIO and Major Jaya Mohad, RMO Muscat Regiment, who assisted me in carrying out this investigation.

Recommendation

(1) In order to confirm the diagnosis further investigations would be required.

(2) Should the disease prove to be Fascioliasis, control measures must be considered.

(3) Owing to the nature of the terrain and the method of husbandry practised, control of the fluke itself would be quite impracticable.

(4) The cause of death in this disease is however by secondary infection from clostridium oedematiens type 2B. Immunity from this infection can be conferred by vaccination with "Clostrin" (Glaxo Ltd). Only one vaccination is required, as the immunity obtained is very strong and is thought to last for life.

(5) The Government VO was given information on how to obtain supplies of this drug should it be necessary.

3. SAF Donkeys - Nizwa

a. 13 Donkeys were seen at Nizwa. One donkey (No 29) was suffering from fistulas withers, the condition was well established.

General health and management was good. The accomodation was very good.

b. 2 horses were also seen, Samba was fit and in good condition. Rahis was acutly lame L. fore and both fore feet were overgrown. The fore feet were both cut down by one inch, but they are still too long.

The l. fore foot was searched and an extensive abscess of the sole opened and drained. The wound was dressed and long acting penicillen injected. The groom was given instruction on dressing the wound and a supply of penicillen was provided.

Recommendation

(1) The feet of donkeys should be checked regularly and where necessary trimmed.

...../3

These donkeys not on active work should not be allowed to become overfat (See Ref 'B').

(2) Donkey No 29 if it cannot be given prolonged Veterinary treatment should be shot.

To shoot a horse or donkey, imagine diagonal lines drawn from base of ears to eyes. Hold pistol at 3 inches from head and aim at intersection of diagonals.

(3) Unless Rahis can be given regular work she should be returned to Muscat, when sound.

4. Sultan's Horses

a. About 60 horses of all ages were seen.

b. No system of management whatsoever exists for the proper care and maintenance of these animals.

They are kept permanently tied up to bushes on a patch of ground liberally sprinkled with sharp pieces of scrap metal. They are kept alive on a totally inadequate diet of lacerne.

c. Most animals appeared thin and emaciated. They were ungroomed and many suffered from grossly overgrown feet. The use of Arnolds hoof instruments was demonstrated.

Nevertheless many animals were of good basic quality. With proper care and training, I feel that about 70% of them could be made presentable and useful for police or military and ceremonial duties. Some would almost certainly make polo ponies.

d. Outline plans for stables and training facilities for 100 horses have been prepared by Captain D. Brunton SAF. These plans appear to me to be excellent. The accomodation envisaged would be roomy, simple and the cheapest possible, compatible with efficiency and good equine management.

Recommendation

If it is the intention to retain these horses, then it is strongly recommeded that action be taken on the following points as soon as possible.

(1) A proper equine establishment should be constructed, using the plans drawn up by Captain Brunton.

(2) Old and chronically sick animals should be cast and humanely destroyed.

(3) Those horses which are to be retained should be moved to the establishment and given a good diet and careful management. When condition has been gained and the feet correctly trimmed, they should begin training.

(4) The services of a Warrant Officer or Senior NCO of the British Army, trained in equine management, should be obtained. He should have a good knowledge of the care of the feet. Such a man might be obtained either on secondment, or should he be retired, on a contract basis.

It should be noted that shoeing is not practised in Oman and is not necessary in this terrain. However with the increase in road construction it would probably eventually be necessary to shoe police and army horses.

...../.

(5) If the above recommendations are implemented, then the advice of Captain Brunton should be obtained at all stages of the programme. This officer is a Weedon graduate and has considerable knowledge and experience in the management and training of horses in tropical countries.

(6) Under no circumstances should horses be brought to Salalah unless proper arrangements can be made for their accomodation and management.

Summary and Conclusion

Very brief observations have been made and recommendations submitted on:

1. Animal husbandry and veterinary services.

2. Reported epidemic among goats.

3. SAF transport donkeys.

4. Sultan's horses.

Much more time would be required to investigate fully the subjects reviewed.

It is hoped that consideration will be given to the subjects discussed and where possible, action taken on the recommendations.

In my opinion the most important matter under review is the development of veterinary services.

GR DURRANT
B.V.Sc, F.D.A., N.D.D., MRCVS
Major RAVC

Veterinary Officer
British Forces Post Office 66

27 February 1972

Director of Development Dhofar
PO Box 5
Salalah

EXPORT OF CATTLE BY SEA

Present Situation

1. Approximately 145 cattle were loaded into two dhows at Rayzut on 24/25 February.

2. These animals were in a state of exhaustion and near starvation before loading.

3. Five cattle fell off the floats while being transported to the dhows. Four drowned and one was shot, while in the water, by the veterinary officer.

4. Four cattle died on board ship on the night of the 24th Feb. Cause of death exhaustion and dehydration.

5. There appeared to be no person in charge of operations and a state of total confusion and chaos reigned.

6. Taylor Woodrow harbour staff were most helpful but they have neither the equipment nor the experience for dealing with this sort of situation.

7. Cattle were manhandled onto the floats. The cattlemen have no knowledge of moving cattle in this fashion. It was necessary for the VO to instruct them in movement and do much of the loading himself.

8. Cattle on board ship were fed and watered under the direction of the VO on the morning of the 26th Feb. Water and food for the voyage was placed on board during the afternoon.

9. Two veterinary assistants went on board the dhows to accompany the cattle on the voyage to Muscat.

10. Further deaths on the voyage are very likely.

11. Approximately 400 cattle are still on shore at Rayzut. Although they have adequate water, they are without food and starving.

12. The gross mishandling of this operation will probably have a serious adverse propaganda effect.

Forward Planning

1. Although it may not be the governments intention to continue with an export trade, the possibility of further influxes of Jebali cattle cannot be ruled out.

2. If cattle come down again then some official action will be imperative.

3. A director of operations must be appointed to coordinate all action in dealing with such a situation. He might be a civilian or military officer.

4. He should be given powers to obtain water and food. The latter should be procured either from govt sources or by local purchase.

5. Animals awaiting transport must be given adequate food and water.

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6. Adequate supplies must be placed on board ship. The following quantities will be required.

Water per cow per day	4 galls.
Fodder per cow per day	12 - 15 lbs.

7. Loading should be coordinated by the director, if the chaos of the 24/25th Feb is to be avoided.

8. Immediate and decisive action is now required to deal with those cattle remaining at Rayzut. Similar action must be taken should the situation arise again.

9. Failure to take the action recommended will result in:

a. Considerable and unecessary animal suffering.

b. Substantial financial loss.

c. Loss of government prestige, which we can ill afford to lose while prosecuting this war.

GR DURRANT
Major RAVC
VO BATT

Copy to BATT
HQ Dhofar
PSYOPS
Agricultural Officer
Civil Liaison Officer

Veterinary Officer
British Forces Post Office 66

28 February 72

Director of Development Dhofar
PO Box 5
Salalah

MOVEMENT OF CATTLE BY SEA

Reference A: My memo Export of Cattle by Sea 26 February 72.

1. Situation on 28 Feb 72

a. The agents Said SHAMFRI and Co estimate that about 700 cattle remain in their herd now awaiting export.

b. These animals are being held in the Awgud area where they can find just about enough grazing to stay alive.

c. It is imperative that as many of these animals be sent out of the country as soon as they are fit to travel and transport is available.

d. In the absence of any government directive the VO BATT has started forward planning arrangements for the move which may take place during the next six days.

e. As soon as the government appoint a Director of Operations to handle this move the VO will hand over arrangements and give a briefing to this person.

f. The problem is being approached as outlined below.

2. Information needed

a. Who is to direct and coordinate the move?

b. Number of cattle which require to be moved.

c. Information concerning size of ship and conditions on board.

d. Following from (c) above, decide number of cattle which may be moved.

e. Dates when ship can load and sail.

f. Duration of voyage.

g. What is the availability of fodder and water? - the fundamental limiting factor.

3. Action which must be taken.

a. Liaise with Taylor Woodrow concerning availability of floats.

b. Procure fodder and water and place it on board. Plan for cattle to have the following on board.

Water, 4 galls p/head p/day.
Fodder, 10-15 lbs per head p/day.
Sand the floors of the ship's holds.

c. Ensure fodder is not stacked near assembled cattle, thus avoiding the stampede which occurred on 24 Feb 72.

d. Feed and water all cattle before loading.

e. Ensure floats are fitted with uprights and guard ropes, thus avoiding losses by drowning.

f. Organise loading gang. Instruct men how to load cattle onto floats. The loading gang must be firmly controlled and coordinated by one man preferably director of operations or a veterinary officer.

...../2

g. Once loading commences it should be continued with all possible speed.

h. The ship once loaded should sail without delay.

GR DURRANT
Major RAVC
VO BATT

Copy to: BATT
HQ Dhofar
Civ Liaison Officer
Agricultural Officer
Harbour Master, Rayzut

Veterinary Officer
British Forces Post Office 66

Director of Development Dhofar
PO Box 5
Salalah

4 March 1972

JEBALI CATTLE IN SALALAH - PRESENT SITUATION 4 MARCH 72

Reference A: My Memo Movement of Cattle by Sea, dated 28 February 72.

1. Approximately 620 of these cattle remain in the Awgud area. The Agricultural Officer assisted by the Veterinary Officer BATT, have taken action as outlined below.

2. The herd has been divided into two. The weaker and smaller animals numbering about 300 have been driven to the Khor between Salalah and Awgud. They are being fed by the contractor.

3. This weaker herd is recoiving about 100 plots of lucerne per day. This must be stepped up to 250 per day soonest. These animals are unlikely to be fit for export or slaughter for some considerable time.

4. The stronger herd numbering about 320 is held at the Khor beyond Awgud. About half the herd are now fit to travel. The remainder should be fit to move in about five days.

5. This herd was fed today on a mixture of chopped banana trees, turnips and bullrushes.

6. The diet should be improved by an increase in turnips. The food and labour for this herd is being provided from government resources.

7. As soon as shipping is available steps should be taken to export these animals to Muscat. Mr Abdul AZIZ is looking into the matter, at least four dhows will be required for this consignement.

8. The situation can now be considered to be temporarily under control. However the Dept of Development was informed this morning that many more Jebali wish to move cattle to the plain.

9. Forward govt planning must be put in hand now to cope with such a contingency should it occur, and it may well do so, in the very near future.

GR DURRANT
Major RAVC
VO BATT

Copy to: Wali Dhofar
BATT
HQ Dhofar
Agricultural Officer
Civil Liaison Officer
Civil VO
Harbour Master, Rayzut.

Veterinary Officer
British Forces Post Office 66

16th March 1972

Director of Development
Dhofar
PO Box 5
Salalah

REPORT ON A VISIT TO THE DARBAT 12/13 MARCH 1972

1. Aim To observe the area around Darbat village with particular reference to the livestock situation.

2. Location

Darbat village is at Map Reference 2790, it lies beside the Wadi and just above the Darbat Wall at about 850 ft above sea level.

3. General Description

The main feature of the area is the Wadi Darbat, which is in effect flowing river, of clear fresh water. Whether it contains bilharzia or not is a unknown, however it supports quite a considerable human and animal population and makes agriculture possible in what would otherwise be a desert.

The village itself contained only about ten primitive huts surrounded by about sixty acres of cultivated land.

It is understood that the greater part of the population live in similar sized settlements on the surrounding hills.

4. Wild Life

Many varieties of birds were seen. These included large flocks of pigeons. One pigeon was shot, it was very fat and its crop was full of seeds.

Fish were seen in the river though these could not be identified.

The river and its immediate area abounded with plant life and trees. Further away from the river the vegetation consisted of grasses, now very dry and sparse and thorn bushes.

Large numbers of insects and butterflies were seen and specimens of some of these were collected by the Medical Officer for identification.

5. Agriculture

Unlike other areas seen on the Jebel the cultivated land at Darbat village must be worked during the dry season, because elaborate systems of irrigation channels were present.

The soil appeared to be of poor quality, possibly caused by over cultivation and insufficient manuring. A soil sample was taken for analysis by the Ministry of Agriculture in UK.

Evidence of the following crops was observed.

Sorghum
Grass
Onions
Beans
Papya
Coconut
Bananas

Large enclosed areas of long grass were seen, this grass is cut and carried daily to the cattle on the higher land.

...../2

Much more land could be brought under cultivation without too much difficulty, but like most other areas of the Jebel that have been surveyed, livestock production rather than crop husbandry is probably more desirable both socially and economically.

6. Cattle Population

At present an accurate estimate of cattle numbers is not possible. Sheik Mohd Hamid of the Ma'ashani said that there are about 18,000 cattle on the Darbat. Members of BATT report seeing herds of up to 2,000 head.

On 13th March 500 cattle and 100 goats were seen at water at one time. These animals were of good quality and appeared well fed.

Three cows were slaughtered on 12th March, they yielded a considerable quantity of good quality lean meat. The carcases were examined and appeared to be without blemish and the rumens were well filled..

Large quantities of Ghee are manufactured here and 48 gallons were discovered in a cave by BATT personel.

Most cattle graze on the surrounding hills and are brought to water every second day. There was plenty of dry grass available for grazing and this is supplemented by hay and cut dry grass from the enclosed gardens.

7. Other animals

Goats are not very numerous in this area, but those seen were well fed and much larger than those on the Salalah Plain.

Few donkeys are to be found in the area but camels are said to be kept in large numbers.

8. Summary

This was an all too brief survey but it did confirm earlier general impressions of the Jebel. The Darbat is a most interesting area from the Veterinary, Medical, Agricultural and Ecological points of view. The latter alone would present a valuable study as the flora and fauna are almost completely undisturbed by modern interference.

The human and animal populations are in a state of equilibrium with their surroundings. Any future plans for development should be made with this fact in mind.

9. Possible Approach to Development

The suggestions below have been made by me before but are probably worth repeating.

The main need is not for any special new developments, but revival of the old trade of cattle and Ghee export and as soon as possible of the dried sardine trade from Salalah and Tarqah, so important in former times. Basic Veterinary, Agricultural and Medical aid should of course be given, on the spot with back up from Tarqah and Salalah.

It may not be convenient at present for the Government to undertake a cattle export trade and there are certainly many practical difficulties involved. These problems however are likely to be ones of organisation rather than of a technical nature. It would seem logical to suppose that the best way to ensure peaceful relations between the Sultan's Government and the people of the area would be to encourage a steady and continuous trade between them and Salalah. An exchange which would be to the mutual benifit of the hill and the plain.

...../3

GR DURRANT
Major RAVC
Veterinary Officer BATT

Copy to: BATT
Medical Officer BATT
HQ Dhofar
Civil Liaison Officer
Agricultural Officer

Veterinary Officer
British Forces Post Office 66

BATT

24 February 72

REPORT ON LIVESTOCK AND CROP PRODUCTION IN A SPECIFIED AREA

1. Aim To investigate and make recommendations on the production of livestock and crops in a specified area over a period of 100 days.

2. Preliminary Survey

The veterinary officer and the agricultural officer visited the area on 17 Feburary 72 to make a survey. Their outline recommendations are given below.

3. Basic factors

a. [redacted] (100 troops)

b. Supplementary ration as recommended by Q and catering officer.

ITEM	P/men P/day	Total P/day	Total in 100 days
Meat (unboned)	8 oz	95 lb	4 tons
Veg	5 oz	60 lb	3 tons

4. Meat: No of beasts required

a. It is recommended that beef and goat be produced in equal quantities.

b. i. To produce 2 tons of beef would require 16 cows.

ii. To produce 2 tons of goat would require 160 goats.

5. Allocation of stock for slaughter

a. The Q staff would need to exercise careful control over allocation of animals.

b. One cow would produce approx 250 lbs of beef. This would represent rather more than two days supply.

Meat if kept covered should last at least 24 hours. It would probably be best to slaughter in the late afternoon and allocate $\frac{1}{2}$ the carcase for that day and the remainder for the following day.

c. Goats present no such problem, four goats equal one days ration.

6. Livestock Management

a. A veterinary assistant will be responsible for supervising the care of the animals.

b. The VO will ensure that animals, fodder, (tick spray) and drugs are all installed well before the required time.

c. Both goats and cattle should be housed, separately, in the grass roofed caves or stone walled compounds which are present in the area. This will afford some measure of protection from enemy fire and prevent the animals from stampeding or otherwise encumbering the area.

..../2

d. ~~They~~ Hay will be fed as necessary and urgent steps must be taken to provide this, by the Department of Development. (See Annex A).

e. ~~They~~ Hay should be stacked near to stock pens. A thick layer of brushwood should be used as the foundation of the haystack, which should then be firmly covered with tarpaulin sheeting which should be pegged down. The haystack should be fenced to repel the attentions of marauding goats.

In order to keep the silhouette as low as possible the area of the stack should be increased or several stacks made. . Stacks should be built within the stone enclosures if any spare ones are available.

f. Animals should be allowed to graze the area as much as possible, this will save hay.

Quite a large amount of hay may in fact be surplus, it is thought better to slightly overindent in case:

i. The monsoon is a poor one.

ii. Refugee livestock are brought into the area.

g. Some animals in the area may produce milk. British personnel are strongly advised to boil this milk should they wish to drink it. The danger of contracting tuberculosis and brucella from milk is very real in Dhofar.

h. Manure from the animal pens should be removed daily and carefully stacked. It should be sprayed with fly sprays. Where possible it should be used on the cultivated vegetable plots.

j. Animals should be watered at least once per day and troughs should be provided. (See Annex A).

7. Slaughter Arrangements.

a. Of necessity this will be carried out along traditional Muslim lines.

b. Q staff should endeavour to see that it is carried out in as hygienica manner as possible.

c. British personnel particularly, should ensure that any meat they eat is very thoroughly cooked. Rare steaks should be taken of the menu.

d. Meat when cooked should be eaten at once. Under no circumstances should soup or stews be retained and reheated for eating the following day.

Summary - Livestock

a. Each man should receive 8 oz meat daily.

b. This totals 95 lbs meat p/day.

c. This is provided approximately by:

4 goats total = 160 - 180 goats.

½ a cow total = 16 - 20 cows.

d. The veterinary staff and Dept of Development should implement arrangements for feeding and careing for these animals.

e. The Q and catering staff should do their best to see that meat is handled as hygienically as possible.

...../2

Vegetable Production

a. A more detailed report is being prepared on this subject by the agricultural officer Mr AS BASRAH MSc. However a brief outline of Mr BASRAH's findings is given below.

b. Vegetables to be grown would include:

Potatoes
Sweet Potatoes
Onions
Tomatoes
Cucumbers
Spinach
Egg Plant
Chillies

c. An area of 1 acre would be required to produce the necessary amount of vegetables.

d. It would be necessary to transport a light tractor and implements to the area.

e. As soon as it is known that water is available steps will be taken to commence cultivation.

GR DURRANT
Major RAVC
VO BATT

Annex 'A'

Livestock Statistics

a. Water requirements daily

1 goat ½ gall 180 goats = 90 galls.
1 cow 5 gall 20 cows = 100 galls.

Total p/day 190 galls

This figure will diminish daily;

b. Fodder requirements

1 goat p/day 4 lbs hay
1 cow p/day 15 lbs hay

Total p/day approx 1000 lbs

This figure is theoretical and it must be assumed that some grazing will be available initially, this will increase as the monsoon progresses. Stock numbers will correspondingly decrease.

Approx total requirement will be

10 tons of hay but it should be possible to manage on a lower figure.

c. Air freight space

One bale = 50 lbs

Dimension 2' 6" x 1' 6" x 1' 6" = 5.5 cu/ft.

One ton - 220 cu/ft.
Ten tons - 2200 cu/ft.

Veterinary Officer
British Forces Post Office 66

A/SMB/37

17 February 72

Asst Director of Development Dhofar
PO BOX 5,
Salalah

PRODUCTION OF LUCERNE HAY AND ANIMAL FEEDING

Reference A. My memo Animal Husbandry Bir bint Ahmed, 6 January 72.

1. Haymaking in Dhofar

a. Except for the period of the monsoon the climate of Dhofar is ideal for the making of good quality hay.

b. Most hay made would be from lucerne which produces a particularly high quality fodder. To avoid overmaking, which reduces carotene and general nutritional value and induces loss of leaf by flaking, hay should be made quickly and subjected to the minimum of turning.

c. Now that cereals are being grown consideration should be given to the conservation of straw for bedding and fodder. The production of grass for haymaking might also be undertaken.

d. Fodder could be baled or trussed as required, though baling would be more convenient for the handling of bulk loads and would reduce losses from flaking.

2. Cattle feeding at Bir bint Ahmed (See Ref A. Para 2)

a. The feeding of these animals is still highly unsatisfactory. There is no shortage of fodder, the principal difficulty is to get the supplies from the field to the animals. Frequently the cattle do not receive their main bulk feed until 1300 hrs. No animal can possibly thrive with such treatment. It is realised that the problem is caused by shortage of labour and transport. Although a man is always on duty at the cattle pens he cannot tend the animals properly when no fodder is available. On public holidays the fodder often never arrives at all.

b. The problem could be solved completely by keeping a stock of baled hay at the livestock centre. It could be placed at the back of the bull pens. During the monsoon it would be necessary to cover it with a simple shelter or failing this a rick sheet.

c. The feeding routine could then be, Early morning, hay feed
Midday, fresh bulk fodder
Evening, hay feed
The construction of hay racks would be necessary to avoid waste by treading.

d. The varying of the bulk diet by feeding hay and fresh food will aid digestion and hence growth.

Unless action of this sort is taken soon, the plan to raise a govt dairy herd will be a failure.

3. SAF Donkeys

a. One of the most serious limiting factors in the use of transport donkeys, as opposed to camels, for military operations, is the necessity for and difficulty of, regular fodder resupply. Baled hay would to quite a large extent solve this problem. The daily transport of very bulky fresh lucerne in Skyvans is extremely wastful of valuable air cargo space. Baled hay would considerably reduce the bulk involved and resupply would only be necessary

...../2

weekly or fortnightly. In remote or inaccessible regions baled hay may be conveniently air dropped.

b. A central store of baled hay should be held at RAF Salalah or some other suitable point.

c. Perhaps Defence Department could assist in the making and transport of this hay.

4. Other Military Operations

a. Baled hay will shortly be required to support other military operations and reports and indents for this will be submitted separately.

b. A central store of govt hay if held near Khor Belid would considerably ease the problem of feeding cattle evacuated from the Jebel. This hay need not necessarily be issued free, but could be sold at cost price to incoming herd owners.

5. Haymaking in relation to the Development Programme

a. The making of hay in Dhofar is an extremely simple matter. On the small scale, farmers would require no more equipment than they possess at present. It would be necessary to instruct them in the basic procedures involved and show them the benifits of this change of husbandry methods.

b. Farmers could hold hay in bulk at their houses or farmsteads. They would not then need to make daily journies to and from gardens with small donkey loads of fresh fodder. On public holidays they often fail to do this anyway and animals are left unfed.

c. With the increase of motor traffic in the Salalah area, movement of many small donkey loads will become more difficult and dangerous. The movement of hay in bulk, if necessary by contractors, would be both more efficient and safe.

d. If insufficient lucerne is under cultivation to fullfil govt needs in the near future perhaps more land at Khor Belid could be put down for lucerne cultivation or supplies obtained by local purchase.

e. It is suggested that the points discussed be put in hand soonest.

GR DURRANT
Major RAVC
VO BATT

Copy to: Agricultural Officer
BATT ..... Paras 3 and 4
HQ Dhofar ..... Paras 3 and 4
SOAF TAC ..... Para 3

(i) Approximate daily requirements of hay to maintain animals in good health.

Animal	Daily requirement in lbs
COW	15 lbs
DONKEY (ARMY)	10 lbs
GOAT or SHEEP	4 lbs

(ii) Donkeys should be given a small supplement of bates if available and where possible, allowed to browse.

(See RUSI Journal Sept 1972 p.20. M. Calvert for approach to this subject)

Veterinery Officer
British Forces Post Office 66

Director of Development, Dhofar
PO Box 5,
Salalah

25th February 72

VISIT OF SCHOOL CHILDREN TO LIVESTOCK CENTRE 20 FEBRUARY 72

Reference A. The Veterinary assistants, Gen Policy Training and Characteristics 14 February 72.

1. A party of 87 children with their teachers, from Salalah School, visited the livestock Centre at 1000 hrs on 20 February 72.

2. The programme consisted of a tour of the crop husbandry plots and animals.

3. Simple talks on animal husbandry and crop production were given by Major GR DURRANT RAVC and Mr AS BASRAH MSc. Most children showed keen interest and many, quite spontaneously, made copious notes. A lot of time was given to answering numerous questions. They obviously have a genuine thirst for knowledge.

The talk on animal husbandry was based on the 5 principles which each veterinary assistant is made to repeat when reporting for duty in the morning. These are the basic rules of good animal husbandry and are as follows:-

No 1 Plenty of water.

No 2 Good food.

No 3 Cleanliness of the farmyard.

No 4 A good house.

No 5 Medicine - only when needed.

An exhibition of the basic animal foods was presented. Simple posters illustrating the above points should now be produced. In the health centres run by the British Army in Singapore for the families of Malay and Gurkha troops, instruction in better diet and hygiene was almost entirely by means of posters and simple illustrated booklets.

4. At the end of the programme each child was given a bottle of lemonade and a packet of sweet biscuits (purchased from NAAFI and paid for by DOD). They were also given pamphlets on better farming methods and a picture of the Sultan (provided by PSYOPS).

5. PSYOPS were present to record and publicise the occasion.

6. It is intended to arrange a similar visit to the Experimental Crop Husbandry Farm at Robat in the near future.

7. When the livestock centre is completed it is suggested that these visits be held as a regular feature and if possible a Young Farmers Club formed.

Children joining could be issued with badges and booklets and encouraged to go in for simple proficiency tests and awarded colourful certificates.

8. Mr BRYAN SHAND of Cooper McDougall and Robertson Ltd would be able to provide farming films with Arabic sound track for meetings. Colour slides of farming subjects should be produced and slide shows arranged. The school have specifically requested these. It would be necessary to hold such meetings after dark, or the use of a darkened room obtained.

...../2

9. Similar activities might also be arranged at other centres of population such as Tarqah, Marbat and later White City.

10. The Civil Liaison Officer might be able to assist the Veterinary Officer and the Agricultural Officer in these activities.

11. Considerable patience and energy will be required to organise these events. Although the headmaster was keen on the idea from the outset, many discussions were required before this very simple visit could be arranged. Almost all the adminastrative details must be attended to by the veterinary officer. In this case it was necessary for the VO to accompany the children and teachers on foot from the school, just to ensure that they set out and arrived on time. Nevertheless a start has been made and some basic ideas put over.

Activities of this nature will become less difficult to organise as they become more frequent and people become more familiar with them.

12. Indoctrination of school children combined with simple social events and games is an important feature of the Community Development Programme in Singapore where it has proved highly successful. In Dhofar the enemy are said to be selecting Jebali children* for communist education and indoctrination. The opportunity for our side to undertake similar measures on a wide scale must be siezed - NOW.

GR DURRANT
Major
RAVC

* and of course adults as cadre leaders

Copy to: BATT
PSYOPS
HQ Dhofar
Civ Liaison Officer

Notes on Visit of Children to Livestock Centre 20.2.72.

1. Until this visit there had been no official contact between the school and Govt authorities.
2. A total of 800 boys attend the school. They are very impressionable and eager for any new knowledge - particularly from the outside world, from which they have been isolated (ie until the Coup of August 1970)
3. The teachers numbering about 20 showed the same eagerness for new ideas. None of them had been out of Arabia and few out of Oman itself.
4. The pupils were drawn from the more prosperous and influential families of the community.

5. The idea for this visit arose out of a chance meeting with the English teacher in the street in September 1971. Until then I did not know of the existence of the school.

6. The English teacher Mr Tahir Abdullah said he would like some advice about his own animals and also mentioned that he and a few of his older pupils would like to see the animals at the Govt livestock farm.

7. From this meeting grew the idea of producing educational pamphlets in English and Arabic. The civil authorities showed no interest at all in this idea and it was necessary to force it through using BATT and private assistance (through the manager of the British Bank of the Middle East - Selelah)

8. After the custom of Arabia many talks were required with the headmaster and teachers before it was possible to arrange the farm visit and distribute the pamphlets in the school.

9. Having established this contact over a period of five months, the school and staff were thereafter completely receptive to any suggestions and ideas.

10. They asked for information, films, slides, pamphlets etc on a wide variety of subjects, not only on agriculture.

11. This experience illustrated to me how, in a primitive (and perhaps not so primitive) society a foothold could be established, for the dissemination of ideas.* These ideas could quite easily be given a political slant, in this case the Sultan and his government were projected in a favourable light.

12. Following on from this the west and its values are also projected favourably. (The antagonism of the Communists towards the Muslim religion proved a very considerable impediment to their own PSYOP work.)

13. The potential for indoctrination among schoolchildren in this area is very great and the surface has only been scratched.

G.R.D.
May 1972.

* Connect with newspaper cuttings file July 1972 - Nov 1973 having systematic developments of subversive organisations in U.K.

Veterinary Officer
British Forces Post Office 66
26th February 72

A/SMB/37

Director of Development Dhofar
PO Box 5,
Salalah.

VETERINARY DEVELOPMENT PROGRAMME - TWO-FOLD PLAN

Reference A. Veterinary Development Review March 72.
B. Veterinary Assts, Gen Policy, Training Characteristics 14 Jan 72.
C. Visit of School Children to Livestock Centre 20 Feb 72.

1. The Sector Clearance Plan

a. Passive Policy

i. During the initial stages of the Veterinary Development Programme the public were informed by means of Radio Salalah and PSYOPS of the existence of the veterinary service. When animals were sick they called in the veterinary officer.

ii. For a large part of the year there is relatively little acute animal sickness, as opposed to widespread chronic sickness in Dhofar. During and after the monsoon there is quite an appreciable amount of sickness and the passive policy then has an important role to play.

b. Active Policy

i. If any radical improvement is to be made in the field of animal health and husbandry then an active policy is required.

ii. This active approach is embodied in 'The Sector Clearance Plan'. The VO and assistants drive to an area of the town preferably where a specific case of illness is known to exist.

iii. The animals in that particular farmyard are all examined and basic treatments given where necessary. The owner is instructed in basic hygiene and husbandry.

iv. A group of 5 - 10 houses is then subjected to the same treatment. If necessary the sector is visited again next day and the process repeated. Almost all the owners show pleasure and mild surprise at this approach. The point is that it is well received and the fact that this aid comes from the Govt is emphasised by the distribution of pictures of the Sultan.

v. New sectors are being continually taken into the scheme. Obviously this is only scratching the surface, it is literally attempting to cleanse the Augean stables. Considerable time and determination will be required before results are apparent.

vi. The scheme must obviously be carried outside Salalah and the principle is demonstrated to trainees practically in the field, and by simple diagrams in the sand. The 'sand table exercise' is continually repeated as is the rote learning of basic priorities.

vii. The drive behind this active policy must be continually maintained by the VO or it will quickly be discarded and forgotten.

2. The Youth Liaison Plan

a. The visit of schoolchildren to the Livestock Centre on 20 Feb 72, according to the veterinary assistants, produced not only a favourable inpression on the children and staff but has caused widespread comment among parents and relations.

...../2

b. This initial success must be exploited. A follow up programme must be planned now.

c. Slide shows will be one of the most effective means of presenting new ideas and maintaining interest. Action should be taken to provide colour slides and a projector. It would be necessary to vote funds for this purpose. The dividend on quite a small investment would be considerable.

d. Again the effort must be extended beyond Salalah. The plan should eventually take in Awgud, Dhariz,Taqa, Marbat, Sudh, White City and Midway.

e. A start has been made in Dhariz. Approximetely 100 children attend the school in that very backward town. On 24 Feb 72 talks and a demonstration were given to the school children. The programme was similar to that followed in Salalah except that of course no practical demonstration was possible. However a simple exhibition of animal foods and vegetables for human and animal consumption was presented.

f. The visit was received with very great enthusiasm, the school was decorated with flags and bunting and notices of welcome hung out. As well as the children, all the elders of the village attended.

g. A talk was given by the agricultural officer but it was not necessary for the VO to speak as the veterinary assistants asked to be allowed to speak, which they did very effectively.

h. Again refreshments were dispensed, but a considerable saving was effected by purchasing biscuits in bulk packets and serving squash in plastic cups (provided by Catering Officer RAF Salalah).

j. If this plan is extended, as it should be, then assistance will be required from the Civil Liaison Officer or some form of Community Development Organisation.

Conclusion

The Veterinary/Agricultural Programme is an integral part of the Dhofar Campaign. Success in this sphere will be certain, if the aim is maintained with energy and resolution.

GR DURRANT
Major RAVC
VO BATT

Copy to: - BATT
PSYOPS
HQ Dhofar
Civil Liaison Officer
Civil Veterinary Officer
Agricultural Officer

1. See Section 3 of Ref A re Education Programme.

2. Below Para 9 is most relevant to PSYOPS.

Veterinary Officer
BFPO 66

A/SMB/37

Major W.P. McLAREN, RAVC
Relieving V.O. BATT
Dr Mohammed JALUDIN
Govt VO Dhofar

14 February 1972

THE VETERINARY ASSISTANTS, DHOFAR, GENERAL POLICY, TRAINING AND CHARACTERISTICS

Reference: A. Veterinary Development Programme Dhofar- Review of the Situation at March 1972.

B. Sitrep Veterinary Dispensaries and Assistants dated 21.1.72.

1. Aim

To review the present position of veterinary assistants and to suggest a possible approach to developing their role in the Provincial Veterinary Service.

2. Present Work Force

A total of eight assistants work for the Development Department, three are located at Bir bint Ahmed and the remainder are either under training in Salalah or posted to outstations. Further details on these men are given at Annexes 'A' and 'B'.

3. The General Livestock Situation in Dhofar and the Bias of Training

The standard of livestcok husbandry in Dhofar can only be described as appallingly low, the situation on the Plain being probably worse than that on the Jebel. This low standard cannot be attributed to the intrinsic poverty of the country - it was until recent times rich and fertile - but to the ignorance and indifference of the people.

In this situation advanced clinical and therapeutic procedures are hardly applicable. The immediate requirement here is for an improvement in basic husbandry methods, this point has been made by me ad nauseum in previous reports.

For this reason the main bias in the training of the assistants, has been towards teaching them better methods of husbandry and encouraging them to disseminate these ideas among the rest of the population.

Most of the employees are respectable citizens of moderately good standing in their local communities. This fact places them in a favourable position to influence their neighbours, if they are given suitable guidance.

4. Level of Ability and Standards of Knowledge of the Assistants

You will quite quickly observe that the technical knowledge of the assistants is very circumscribed. They have almost no understanding of the fundamental facts of biology, such understanding as they have is based on folklore and instinct. The latter is however not entirely without value. Their powers of diagnosis are of course extremley limited.

...../2

However they have a good knowledge of simple practical matters such as handling animals and the administration of drugs under supervision. They can generally recognise when an animal is suffering from gross malnutrition, a common enough condition here. They assume, generally correctlythat a thin scouring animal may be suffering from a heavy burden of parasites. They quicly observe a case of mange or tick infestation and they know what to do about these things.

5. General Approach to Training

The approach to training has been deliberately kept very simple. Assistants have been taught to recognise and use the basic drugs. They have been shown that the administration of sugar and water per OS and iron parenterally or per OS are useful in cases of malnutrition and most cases seen, suffer from malnutrition. The sugar is obtained from the owner and iron is cheap and this form of therapy proves remarkebly effective in many instances. The owner is given instruction in better feeding methods and generally fails to realise that recovery has been brought about largely from his own resources.

Assistants have been taught the importance of hygiene and methods of dressing wounds. They have been shown that traditional branding of the offending area with hot irons is bad therapy. Emphasis has been placed on the importance of trimming feet and they have been shown that the correct way to restrain a sheep or goat is to hold its body and not the extremity of a limb, thus avoiding fractures.

Much teaching has been by rote and on reporting for duty each day assistants repeat the following list of priorities.

1st Water

2nd Food

3rd Cleanliness

4th Good housing

5th Medicine - if necessary

Having mastered this catechism themselves, they repeat it to other people with a certain amount of pride and authority. In a few cases it has some effect, but the process must be continually repeated or it is soon forgotten.

The Arabs temprament must be taken into account when approaching training of the assistants. They frequently reply "Yimkin" (perhaps) when told of the need to carry out certain procedures. By dint of repetition they have been conditioned to say "not Yimkin but Lasim" (must). Again they repeat this to animal owners who often take the hint.

Although this approach to training may sound childish, in view of the appalling standards prevailing in this country, it has been thought appropriate and in some cases produces the desired result.

6. Appropriation of Tasks and Supervision

Assistants and trainees in Salalah work under the direct supervision and instruction of the V.O. Before setting off on calls they may be given a brief period of instruction and then asked to name the main drugs on the pharmacy shelf.

...../3

Occasionally when visiting a location, to say, spray a herd of goats, the V.O. has left the senior man in charge and made a visit to an outstation. The senior man has been told to see that the task is completed and that any other necessary jobs such as foot trimming are carried out. If there is still some time to spare the senior man will then call at surrounding houses and check if any other animals need treatment, generally several need their feet trimming if nothing else. At the same time assistants distribute instructional pamphlets and pictures of the Sultan.

Outstations are inspected at frequent but irregular intervals, assistants who are literate keep treatment books and these are checked. Any drug requirements are noted and delivered as soon as possible.

On days when only a few cases of sickness are reported, the V.O. and the assistants drive out to a location and look for work. It is never difficult to find a few animals which require spraying or their feet trimming. Owners do not resent these intrusions provided they are made tactfully. Frequently such expeditions lead to several other cases being presented for treatment.

7. Further Expansion of the Veterinary Service

At present assistants are stationed at Awgud, Dhariz and Tarqah. It is hoped to extend activities to Murbat and White City in March. Two trainees from Sudh will commence work on 1st March. Midway is a gathering point for the watering of flocks and herds and it should be possible to establish an assistant there and at other suitable locations in the fairly near future.

As the service expands almost the whole time of one V.O. will be taken up in visiting and assisting the outstations. The aim should be to get the main effort out of Salalah and into the peripheral area. People living in the remoter regions will not be impressed with the shining new veterinary hospital in Salalah, if their own flocks are dying of liver fluke or their cattle are going down with milk fever.

As the programme advances it will be necessary to raise the standard of training of the assistants. When this happens they should be given further, on the job instruction, in their own locations. This again will absorb much of a veterinary officer's time.

8. Future Approach to Training

As education in this country becomes more widespread, general standards will rise and so, one hopes, will levels of stock management.

Children at Salalah School are now being taught very elementary biology. Close liaison should be maintained with the schools and farm visits and instructional periods should be arranged whenever possible. As a result of such liaison it should be possible to recruit a better educated type of assistant. It will then be possible to give a more advanced type of training covering such subjects as biology, diagnosis, therapeutics and laboratory techniques.

As a result of this more advanced training some assistants could be employed as laboratory technicians and others as livestock husbandry advisory officers, similar to those employed by the Ministry of Agriculture in the U.K. Veterinary Officers would then be free to concentrate more on the technical aspects of disease control and preventative medicine, something which they cannot effectively do at present.

...../4

9. Morale of the Assistants and the "Hearts and Minds" Campaign

It should never be forgotten that the Development Programme is part of the "Hearts and Minds" campaign aimed at helping to combat communist inspired insurgency. Any gains in the agricultural sphere are ultimately just as worthwhile as those obtained by acts of war.

This is an agricultural economy and although standards are abysmally low, the value placed upon livestock is reflected in the grossly inflated prices at which it is sold. The welfare of livestock often has a vital effect on the liveliehood of many families, particularly the Jebali. Any aid to livestock is thus appreciated and if it is made obvious that this aid stems from the Sultan, then his government gains in prestige and popularity. Owners often exclaim "Quaboos good" when an animal is given an injection and this sentiment should be encouraged and reciprocated.

The assistants all manifest a strong loyalty to the Sultan and they and many owners regard the V.O. as his direct emissary. Following from this the assistants see themselves indirectly as agents of the Sultan, this gives them a certain self esteem and helps to consolidate their position in their own communities.

Although the Dhofari is by nature inclined to indolence, with encouragement and training and the incentive of a good income and the feeling that he is a responsible member of the community, the assistant can be induced to give of his best. It is up to the V.O. to maintain the impetus, provided he appears to be making determind efforts, the assistants, who show quite a measure of loyalty, will attempt (sometimes rather erratically) to follow.

The assistants as a group have quite a strong esprit de corps, the comradeship among themselves is noticable and they show a feeling of friendship towards the V.O. provided he gives them sympathetic treatment and continual encouragement in their work. They do not resent being rebuked when this is seen to be deserved and not overdone.

This community feeling is strengthened by the holding of informal coffee parties in assistants' houses after work has finished and by occasional Jumma picnics at Rayzut beach. They show considerable initiative in organising the latter and derive great pleasure from them and this should be encouraged.

Livestock assistants in Kenya are issued with simple khaki uniforms, this might not be suitable in Dhofar, but it might be possible to issue veterinary department armbands or badges to encourage the corporate spirit.

Being simple people the assistants need sincere and positive leadership and if they know the leader can be relied upon, they willingly accept and respond to it.

As well as helping to improve standards of livestock husbandry the assistants have quite a degree of social influence in their communities. By maintaining their morale at a high level the aim of the "hearts and minds" campaign is advanced.

10. Summary

a. The aim of this paper has been given.

b. Details of the present work force have been outlined.

c. The general livestock situation in Dhofar and the bias of training have been described.

...../5

d. The level of ability and standards of knowledge of the assistants have been discussed.

e. The general approach to training has been given.

f. The method of appropriating tasks and supervision of work have been described.

g. Plans for extension of the service have been outlined.

h. Suggestions have been made for future approaches to training.

j. The importance of the morale of the assistants in relation to the "hearts and minds campaign" has been discussed.

Conclusion

The success of the veterinary development programme will depend almost entirely on the effectiveness of the extension schemes, which will be operated on the ground by the assistants. The impetus for this must stem from the Veterinary Officers. There will inevitably be many setbacks and disappointments on the way. Failure to maintain the aim or any slackening of effort, will cause any gains to be quickly dissipated. The quite recent and rapid degeneration of the former prosperous agricultural economy of Dhofar, emphasises this point.

If the aim is maintained quietly, steadily and relentlessly, in five years time definite improvements will be quite apparent. In ten years time Dhofar will be a prosperous and self supporting province of Oman.

GR DURRANT
Major RAVC
V.O. BATT

Copy to:

Director of Development Dhofar
Asst Director of Development - Dhofar
Agricultural Officer
Civil Liaison Officer
BATT
Psyops
HQ Dhofar

ANNEXURE 'A' TO ASM/B/37 dated 14th February 1972

	Name	Location	Level of Education	Knowledge of English	Remarks
1.	Sala bin Hassan	Salalah	Quite good, literate and has Junior Edn . Cert.	Speaks enough to get by. Can read and write a small amount.	Acts as rounds foreman - Salalah.
2.	Bahret Said	Trainee Salalah	Illiterate	Nil	For White City late March
3.	Ahmed Mohd al Habah Shamfri	Livestock Centre Salalah	Quite good. Literate.	A little spoken English	2 I/C to foreman Birbint Ahmed
4.	Ahmed Mohd Salem	Trainee Murbat	Illiterate	Nil	For Murbat late March
5.	Hafiz Ahmed	Salalah	Quite good, Literate	Slight knowledge of spoken English, can read a little.	General ..ssisant Salalah
6.	Mohd Ayndrus	Awgud	Quite good, Literate	A little spoken English, can read and write a little.	Lives in Salalah, commutes to Awgud daily.
7.	Ahmed Ali Fat	Tarqah	Very good	Fluent, writes it quite well, reads novels.	Spent 18 yrs in the Gulf working for Europeans.
8.	Salem Omar	Dhariz	Illiterate	Almost nil, but somehow it is not difficult to communicate with him	Lives " over the Shop "

ANNEXURE 'B' to ASM/B/ . / dated 14 February 1972

General Characteristics of Assistants

1. Salem bin Hassan

The most cheerful and energetic member of the team. He acts as rounds foreman in Salalah. Occasionally apt to run away with himself, but makes up for any shortcomings by his obvious dedication to the job.

2. Bahret Said

A new trainee, of the Bait Kathir. He is completely uneducated but is very quick to learn and is basically very intelligent. Although very slight he is a willing worker. He is determined to save up to buy a house and says that he is willing to work on the Jebel or anywhere else.

3. Ahmed Mohd al Habah Shamfri

A quiet sincere man, he is assistant foreman at the livestock centre. Occasionally he shows reluctance to put the necessary pressure on his subordinates. When this occurs he requires gentle prodding, a concientious worker.

4. Ahmed Mohd Salem

A young trainee from Murbat, rather dreamy at times. He generally tries hard but needs supervision. When he is posted to Murbat perhaps the Medical Assistant might take him under his wing.

5. Hafiz Ahmed

An intelligent young man but constitutionally lazy. He is quite capable of doing his work but needs driving. He should be put on a months report by the Department, if he does not mend his ways, he should be dismissed.

6. Mohd Aydrus

An intelligent man of good family. He is in charge of the outstation at Awgud where he keeps good written records. He appears to be doing well in this posting.

7. Ahmed Ali Fat

A highly intelligent man and very well educated by local standards. He is in charge of the outstation at Tarqah, where he appears to have made an excellent start. In the absence of the medical assistant he has been assisting BATT in medical work. OC BATT at Tarqah said he is very pleased with the way this man has settled down in his posting. Under no circumstances should he be allowed access to alcohol.

/ annexure 'B' sheet two

ANNEXURE 'B' sheet two

8. Salem Omar

An older man who is in charge of the outstation at Dhariz. He is a person of some substance in that town. Although completely uneducated he is basically very intelligent and is a most concientious worker. Until he was "converted" he was the local expert in the use of branding irons.

REPORT ON VISIT TO MUSCAT-OMAN 14 - 19 MARCH 1972

BY

R.L. WOOLDRIDGE, VET. & ANIMAL HUSBANDRY ADVISER

MIDDLE EAST DEVELOPMENT DIVISION, BEIRUT

The afternoon of 14th and morning of 19th were spent in Muscat, the days between were spent in Dhofar Province.

A. In Salaleh, Dhofar Province, meetings with:-

Mr. R. Young	Director of Development, Dhofar
Mr. M. Butler	Assistant Director of Development
Major G.R. Durrant	R.A.V.C.
Mr. Abdu Sittar Basrah	Agricultural Officer
Dr. Mohamed Jaludin	Veterinary Officer (Pakistani)

and many officers of the Sultan's Armed Forces.

1. GENERAL

I was looked after and taken around by Major Durrant. I met junior veterinary staff who had received elementary training from the Veterinary Officer, saw the type of clinic which he is setting up in 6 places, visited the poultry scheme, Friesian bulls, the dairy farm buildings and veterinary hospital, the agricultural experimental farm and a small number of livestock owned by villagers. I was also taken by air to a camp in the Jebel and saw a handful of livestock there. I had discussions with Mr. Young, Director of Development Dhofar and his assistant Mr. Butler.

2. I will not reiterate that which has been written previously by Jack, Johnson and Durran but with some overlap will continue from where they have left off, using their reports for some of my conclusions and recommendations.

3. PROFESSIONAL STAFF

The three RAVC officers who have been based at Salaleh in turn since September 1970 have done a good job in laying the foundation for making the people aware of a veterinary service in the area. Unfortunately their tour of duty is normally only 6 months at Salaleh. However, Major Durrant in particular has ensured the best possible continuity by full recording on paper of what he has done, what he is trying to do and what he recommends be done on certain subjects. There is now a Pakistani Veterinary

officer Dr. Mohamed Jaludin recently arrived in Salaleh and Major Durrant was about to hand over his own duties to his RAVC replacement due to arrive the day I left.

4. JUNIOR STAFF

There are 8 Veterinary Assistants who have received a certain amount of elementary training from the RAVC officer. Some are already placed on outstations, others will be so placed. Stations to be manned are mainly on the coast with one or possibly two later on the hills. They are at Salaleh, Murbat, Awgud, Tarqah, Drariz and Sudh (later). Each will have simple veterinary equipment and a few drugs and will be visited regularly by the Veterinary officer to help and guide them in their duties.

5. DISEASE

The disease problems encountered amongst the livestock so far are few compared to those seen in other countries of the Region. There is no evidence of enzootics or epizootics causing severe losses and the veterinary attention being given is treatment to individuals rather than to herds or flocks except where internal and external parasites are concerned. Mal-nutrition, misshapen hooves, and wounds are the most common problems. Teaching of Veterinary Assistants for passing on to stock-owners consists of a repetition of basic principles of management, i.e. water, food, cleanliness, good housing and medicines if necessary.

6. AREA OF OPERATION

At present the veterinary service is provided mainly on the coastal plain which has a small livestock population, believed to be between 3000 to 6000 cattle with possibly 4 or 5 times that number of sheep and goats, with goats predominating at about 70% i.e. about 14,000 goats and 6,000 sheep. The larger cattle population in the hills, believed to be up to 20,000 is largely inaccessible at present.

7. AGRICULTURE

There is about 3,000 acres of agriculture on the plain and the livestock are dependant on this, particularly on lucerne grown

from October to May and then on grasses, hay, sorghum, sweet potato, etc. There is only just enough fodder grown to meet present normal needs. When other livestock suddenly appear, e.g. either brought down from the hills or imported by sea, and have to be held, there is considerable difficulty in providing food for them. Plans for the livestock industry in the plains must go hand in hand with plans for agricultural production of fodder.

The experimental Agricultural Station at Salaleh appears to have been built up very quickly by Mr. Abdu Sittar Basra. He has a number of varieties of lucerne on trial all of which are affected by rust, some as early as in March and others holding out until May. He has a sterile hybrid Napier x Bullrush (I query whether this may in fact be Napier x Millett) grass growing well and looking to be a better fodder grass than Napier. He hopes for 35 to 50 tons of green fodder per acre from it. He has another grass giving a good bulk and palatable to stock, which, when it came from Digdagga, in Ras el Khaimah, was supposed to be Rhodes grass. It is however not Rhodes which would also be worth trying at Salaleh. So far I have been unable to identify it, even after taking it with me to Digdagga. He is also experimenting with sorghum for fodder. A number of other crops, largely vegetables are being grown but the experiments with fodder crops are most important for any development of the livestock industry.

8. POULTRY

The experimental poultry unit is run on a semi-intensive system, with housing leading to a large outside sandy yard. Two hybrid varieties have been imported. There were early losses and disease affected them as adults with birds dying of what sounds like Infectious Bronchitis, at the same time as local birds were dying. I understand there has been about a 50% loss from original intake and that the purpose of the scheme was to see the problems of intensive poultry keeping in the Salaleh climate. Major Durrant has put on paper his recommendations for an intensive deep litter system with air-conditioners. I suggest this is combined with experimental pens under different conditions, for comparative purposes

e.g. wired open-sided and shaded pens, with overhead fans in walls and air vent in roof and similar pens with air conditioners. I also suggest that consideration be given to maintaining a dual purpose breed in order to put out young cockerels and/or fertile eggs for hatching, to local people. The modern hybrid bird is produced for specialised forms of production, and is less likely to be suitable for introduction to village or backyard poultry production in Salaleh than the less productive "old-fashioned" type of bird such as a Rhode Island Red. The disease situation should be taken in hand in order to protect any new importation of chicks I suggest that an attempt is made to get serum samples to the NEAHI.Poultry Reference Laboratory, Fanar, P.O. Box 3216, Beirut, Lebanon, with a request on advice on vaccinations of new importations, with particular reference to Infectious Bronchitis. It may be however easier for the RAVC Veterinary office to make arrangements with the NEAHI Laboratory in Cyprus through his RAVC colleague for this and transportation to Cyprus.

9. CATTLE

The 2 Friesian and the 1 Friesian x Hereford bulls have now served 48 local cows of which 12 were slaughtered by owners, 4 served by other bulls and 22 became pregnant, two of which have calved, one a Friesian type calf and the other a local type calf. Major Durrant has written a paper on the use of these bulls but he would also like to see them quietly phased out as discreetly as possible. I believe that a compromise of the recommendations by Jack (1955) and views expressed further on this by Durran (1971) and the "fait accompli" of the Friesian bulls, could be made to the benefit of Dhofar Province without the undesirable act of disposing of the Friesians. Jack wanted to see the build up of a selected dairy herd of local cattle, Durran thought that any experiment with exotic cattle should be with "a breed from an approximate homoclime, such as Sindhi or Sahiwal from Pakistan". I agree with these views and would like to see experimental herds at Salaleh based on local (hill) breed and the crossing and back-crossing of these with Sahiwal and Friesian bulls. It would be a long term programme and if development of Dhofar agriculture is going to proceed at a satisfactory pace it is necessary to get as much information

as possible on breeds of cattle which will fit into the future pattern of land use. Probably the biggest Sahiwal stud in the world now is in Kenya from whence semen would certainly be available, but I do not know their present policy on sale of bulls. I include the Friesian bulls in this experiment because they are there and experimentation with them has already started. Of European breeds the Jersey has a better reputation for heat tolerance.

10. DAIRY FARM BUILDING & VETERINARY HOSPITAL

Plans have apparently been approved and the site is now laid out for building to commence. I suggest consideration be given to have a simple demonstration dairy farm unit attached to the main centre for practical demonstration of what the local farmer should be able to do for himself with posts, rails and overhead shade made of locally grown materials. With home-grown fodder fed to selected indigenous cows or upgraded crosses, under correct methods of dairy hygiene and management, together with proper rearing of calves. When the security position allows a similar unit could be set up in the Jebel on a small dairy-ranch basis for beef and ghee production.

11. IMPORTATION & EXPORTATION OF LIVESTOCK

Price of meat is extremely high in Salaleh, with plains cattle fetching up to RS.60, poor quality goats up to RS.12, whereas fair quality sheep have recently been imported from Somalia at RS.9. Government have been paying RS.40 for cattle brought down from the Jebel. There have been three importations of livestock recently, two of which included cattle. Two problems arise, firstly the danger of bringing in disease to what seems to be a relatively disease free area at present, and secondly their fodder requirements until they are slaughtered. Exportation of animals also takes place when cattle are brought down from the Jebel for local administrative reasons. There is nowhere to hold them and feed them. They are an embarrassment to government and arrangements have to be made to get them out of the area as quickly as possible. One lot had recently been shipped to Muscat and a second lot was about to go there when I was leaving. I recommend that

Government should set up quarantine facilities with a fodder bank of hay. It is advisable also to maintain an adequate supply of Rinderpest Tissue Culture vaccine to be used on all cattle arriving without certification of vaccination and for emergency purposes should the disease occur, in local herds, from importations.

12. SLAUGHTER OF ANIMALS

I understand that this is not controlled or centralised at present but that there are intentions to do so, and also that simple butchers slabs and rails are being put up in the market. I hear there have been tentative thoughts on the setting up of a modern abbatoir with a view to export of meat. I consider it is too early to think along these lines yet. There is no indication of a surplus of meat locally, export of cattle has only taken place recently because of two unusual movements of a large number of cattle in big herds from the hills for administrative reasons. There is no evidence to show that the livestock population has increased considerably over the last 20 years, and the customs of the people seem to preclude this. Here I refer to the slaughtering of bull calves at birth or soon after, and the slaughtering of females even when in calf, on ceremonial and other occasions. With the present "guesstimate" of cattle figures being at 20,000, or possibly 25,000 head, and at a normal ranching take-off of between 8% to 12% per year, even if present customs cease, the number available for processing in an abattoir would be between 1600 to 3000 head per annum, some of which would be absorbed in the local market. For the present I consider all that is required is a central killing point of a concrete base with water and drainage, hoists and hanging bars, overhead shade and half walled open sides and door to keep out the village dogs.

13. GHEE

This used to be a valuable export and it is reported (Johnson 1971) that 1963 figures may have been 40,000 gallons at £13 - 15 per 4 gallon tin. No ghee is brought down from the hills now for administrative reasons on internal problems. As administrative access and control in the hills improves

this industry could well be encouraged and assisted by official centralisation for collection and delivery to export traders. Veterinary assistants in the hills could be used to encourage clean good quality production.

14. HIDES AND SKINS

Even with a small livestock industry, hides and skins are still worth proper attention in preparation and handling. The difference in value to the trade between a damaged hide and a good one is considerable. Veterinary assistants might well be given instruction in proper flaying, cleaning, drying and storing to pass on by demonstration to the livestock owners in their areas of operation.

15. SUMMARY OF RECOMMENDATIONS

a. Cattle breeding experimentation could be expanded to include comparisons of performance both milk and beef, between local cattle and crosses with Friesian and Sahiwal bulls (or Sahiwal semen).

b. Dairy farm area could benefit from a practical demonstration unit attached to it, showing what could be done by local villagers towards improvement of dairy and calf production. Later a similar unit for beef and ghee production could be set up in Jebel.

c. Poultry scheme could include comparisons of poultry houses under hot climatic conditions with a view to future broiler and egg production commercial enterprises and could give consideration to improvement of the local backyard poultry by introduction of a dual purpose breed.

d. Setting up of quarantine station and fodder bank for import and export of livestock would be advantageous.

e. Items (a), (b) and (d) above would necessitate planning green fodder and hay requirements and setting aside a suitable agricultural area and financial provision to work it.

f. As an alternative to local thoughts on a modern abattoir, I feel that central slaughtering facilities with basic

requirements for hygiene, i.e. washable floor, water, drainage, hoist, hooks, shade and half walls would be adequate for the time being.

g. Consideration could be given to improvement of hides and skins for export, and when administratively possible, to restarting the ghee industry by organised collection and delivery to traders.

h. On animal diseases, Rinderpest Tissue Culture vaccine could be held available for emergencies (it should remain viable for 1 year in a refrigerator at 0 to 4°C and indefinitely in a deep freeze at -20°C). Contact with a poultry disease diagnostic laboratory to establish diseases present and vaccinations required, particularly for any new importations of birds is advisable.

i. I consider that now is a suitable time for the Director of Development Dhofar with his agricultural and veterinary advisers to benefit from a review of their present position on the technical information being obtained locally, on development which has taken place, and on projects in hand and problems to be faced. From this they could consider where their development is leading, what is desirable and what is feasible and come to conclusions for a workable long term development plan with all activities being co-ordinated with each other for the purpose of achieving an integrated agricultural-livestock development plan for the Province.

APPRECIATION

I wish to thank the Director of Development and his staff and the military personnel who were all so helpful to me and made me so comfortable and gave me so much hospitality. In particular I wish to record my appreciation of the help I received from Major G.R. Durrant R.A.V.C. who gave up most of his time over four days showing me around, giving me a very comprehensive briefing and ensuring that I met as many people as possible to help me build up a picture of my particular interests.

B. MUSCAT

Officials met were:

Mr. Salim Makki	Director of Oil & Agriculture
Dr. Syed Shamimirrahram	Veterinary Officer (Indian)
Brig. Bailey	Minister of Defence, Muscat
Col. Oldman	Defence Secretary, Muscat

1. From discussion with the Director of Oil and Agriculture and the recently appointed Indian Veterinary Officer it appeared that there was little information immediately available on livestock numbers and their disposition in the north of Oman, or on the disease problems to be encountered. The Veterinary Officer has no staff but has asked for 4 veterinary assistants for training. The country imports meat, some from Somalia. Goats are sold between RS 15 to 25 which seems very high. There is no recognised hide and skin export, and there is importation of ghee when it used to be exported.

2. The country is at the beginning of setting up a veterinary service. I asked the Director of Oil and Agriculture if his Government would like some advice on the subject and he welcomed the idea and I was asked to return for a longer visit, make a tour of the north, see what may be required and make recommendations accordingly.

3. The veterinary officer asked me for some names and addresses of firms from whom he could order drugs and equipment. I will send these to the Embassy for passing on to him.

R.L. Wooldridge
Middle East Development Division,
Beirut

April, 1972