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TUNISIA

Report of Livestock Consultant

November 1972-January 1973

by

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(Year on regular)

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I. INTRODUCTION

To help the Government of Tunisia increase that country's meat production, the U.S. Agency for International Development (USAID) in mid-1971 funded two U.S. Department of Agriculture (USDA) technicians for work on an Accelerated Livestock Production Project. One specialist was to assist with range management, pasture and soils improvement, and dryland forage production. The other was to be concerned with irrigated forage production techniques, small-scale irrigation design and engineering for forage/feed grain production, and soils improvement.

To further aid in the livestock improvement effort, USAID and the USDA specialists requested a livestock consultant for 3 months beginning November 1, 1972. The specific objectives for his assignment were:

1. To give guidance in improving and expanding the existing artificial breeding program in cattle.
2. To help establish standards and guidelines for good animal husbandry practices, including feeding, breeding, production, marketing, and disease control.
3. To help organize and plan a national health plan for controlling livestock diseases in the herds and flocks of Tunisia.
4. To help the Tunisian operations management system make more efficient use of veterinarians.

The report on this consultant's work follows.

II. THE ARTIFICIAL INSEMINATION PROGRAM

The cattle artificial insemination program established at Sidi Thabet in 1964 by USAID is now headed by Dr. Kafalla, the Tunisian Director, and Dr. Gallet, a Belgian veterinarian. This bull stud service has grown to where 13,707 first inseminations were made in 1972, an increase from 8,683 first inseminations in 1968 (when this consultant completed previous AID-sponsored work with the program). Efficacy of breeding is 1.8 services per pregnancy.

The facilities at Sidi Thabet are clean and well administered, and the technicians are well trained. The use of frozen semen has improved the service and has eliminated some major problems.

Three breeds are now in service: Holstein, Brown Swiss, and Tarantais. All have a place in Tunisian agriculture. In my opinion the Swiss represent the best animal for crossing on the local brown atlas cattle. The F_1 and F_2 crosses show promise of increased milk production and the males show promise for beef feeding.

The main impact of the bull stud program will be achieved when large numbers of local cattle are bred to good quality artificial insemination bulls to produce good quality F_1 stock.

The main deterrents to the program now are:

1. Inseminators are not paid according to incentive.
2. Too many local bulls are running with cattle. Until some of these are castrated and artificial insemination used, the program will not go ahead at a fast pace.

The livestock production project could very well use artificial insemination on its pilot farms. This would serve as an extension education program to help stimulate use of the service. Using a monthly herd check on the dairy herds as recommended in the sterility paper (Appendix II) would also be an excellent extension education program. (See reference 3 in the Bibliography.)

The consultant obtained permission from Dr. Kafalla to allow the Peace Corps Volunteers in Kef (Mr. and Mrs. Haaland) to establish an artificial insemination center there. Mr. and Mrs. Haaland are both accredited artificial insemination technicians in the United States and will be good representatives of the program on the pilot farms of the livestock production project and other selected farms. This presents a breakthrough for the Peace Corps and the artificial insemination service. This was accomplished through work with the Commissaire of Agriculture in Kef.



III. GUIDELINES FOR IMPROVING ANIMAL HUSBANDRY

The consultant is in full accord with the project objectives, which very simply stated are increasing the production of animal products, i.e. milk, meat, hides, wool, etc. The reasons for needing more of these products is equally simple:

1. Population of the country is growing;
2. The per capita consumption of meat and milk is low;
3. The production of the country is less than the requirements, making importation of powdered milk and meat necessary;
4. Losses incurred in the co-op era and the flood have very seriously depleted the female herds and flocks;
5. Large numbers of sheep are killed for religious holidays; and
6. The country's natural resources are more concentrated in the agricultural field.

Serious questions raised are:

1. How can we make meat and milk available to the head of a family who earns .700 TD a day, when that meat costs 1,200 TD per kg. and milk costs 0.092 TD per litre?
2. Are we only going to be able to work with the affluent farmer, Office Terres Dominiales (state owned) farms, or co-op's, or can we in some way help the poor farmer with small holdings of land and livestock?
3. Which animal converts feed most efficiently; is it poultry, beef, dairy cattle, sheep, or goats?
4. Will traditional wheat farmers shift their production to forage or barley (animal feed) production?
5. If we rely on World Food Program (P.A.M.) feed at subsidized prices to promote a feeding program, what are we going to do when P.A.M. is gone and we may or may not have adequate feed grain on hand and grown in Tunisia.
6. Should we be thinking ahead now and projecting work with sheep and goats which use the major part of the land area of the country as pasture?

Part of the problems facing the project from the standpoint of projecting future work is the difficulty of arriving at a reliable census of animals. Animals move from one gouvernorat to another. However, data from the 1966 and 1972 censuses is shown in Table 1. Please note the drastic reduction in number of sheep and cattle and the increase in numbers of goats. The camel population has remained the same.

The project is well conceived in that it is integrated; forage, small grains, irrigation, and animal husbandry are all given attention. With the large amount of resources and personnel on both the United States and Tunisian side, it should go forward very well. The idea of extension work being done on pilot farms, rather than research work, is laudable; it is the only way the information will be disseminated.

The project must take very close cognizance of cultural traditions and eating habits of Tunisian people. Tunisians are traditionally lamb and mutton eaters. While tourists and foreigners in the country will consume large quantities of beef, an education campaign will be necessary to increase beef consumption by the Tunisians. Until we satisfy the needs of Tunisians, we should not think of exportation. Without question, effort should be made to grade meat so that poor cuts can be priced cheaply and made available to poor people. Let the higher quality cuts be priced accordingly. Marketing information should be studied and made an integral part of the livestock production project.

A problem facing the project, as well as the whole country, is the difficulty of promoting preventative veterinary medicine. Help is not traditionally sought until losses have occurred. Many times, judicious use of vaccines and worming products would prevent large losses (see Thiabendagole proposal in Appendix III).

The consultant has prepared simple health calendars for both cattle and sheep operations (Appendix I). These health calendars will help the pilot farms conduct an extension program of preventative veterinary medicine. A list of all veterinarians and their locations has been given to Mr. Dolton Comeaux (USDA/AID Accelerated Livestock Production Project advisor in Tunisia) along with the census of each area and the principal diseases found there. Contacts were made at Pharmacie Centrale so Mr. Comeaux can procure drugs. Dr. Hicheri has agreed to sign any requests.

The livestock production project has all the specialists needed except two: I recommend that a sheep and goat man be added as well as a veterinarian. If the project moves south as planned, the sheep man is needed. If the project is going to be enlarged, and many extensive farms added, the health angle cannot be ignored. Veterinary assistance should be added to the project (see section IV in this report).

Careful attention should be given to the work done at El Afareg in beef feeding. Salient features of the report in French have been underlined by the consultant, and are being translated into English. The information on forage feeding using locally-grown crops should be studied. This work was done with local cattle and crossed cattle, and the results may be applied to some of the farms in the project. The cost figures of locally-grown crops should be especially helpful to the project planning.

Evaluation of the work with subterranean clover at Sejenane should be made. The data on beef cattle gains per hectare are very interesting. A study of varieties suitable for use in the areas of project pilot farms should be studied with INRAT (national agricultural research laboratories) personnel. Small plots of pilot farms could well be used as demonstration pastures for extension work.

Use should definitely be made of cereal pasturing. This includes crops planted for total pasturing with no crop harvested and those planted for pasturing for short times and then a crop harvested. Varieties of rye and barley should be planted that have long vegetative growing seasons. This kind of pasture should be used for fattening cattle and flushing sheep. Female sheep would be pastured March 15 to April 15, after which the ram would go in for at least 30 days. This is cheap flushing and results in a better and more closely grouped lamb crop. This has been proven in previous work (see seminar 1967-68, Bibliography item 4).

The possibility of increasing pasture yield with increased use of fertilizer merits further work. This may be one of the cheapest and easiest ways to increase pasture on project farms.

The parcours improvement work at Ousseltia is also recommended for consideration on project farms. Animals in Tunisia are too often pastured on very poor pastures. Scarification, seeding, and fertilizing have produced remarkable results; these ideas should be pursued on project farms.

The use of atriplex and unarmed cactus hold great possibilities when the project moves south. These are life saving plants for Tunisia.

I would like to see Sidi Thabet Dairy School graduates put on the project's dairy farms. Without personnel like this on the farm, it will be impossible to do the sophisticated record keeping and management practices so essential to a dairy enterprise.

The Chenchou project is extremely interesting and should prove an immense help to the livestock project. Orders should be placed

immediately for hay for project farms. It is much more economical to buy alfalfa at .025 TD than native poor hay at .022 TD. I recommend that, in cooperation with the young aggressive veterinarian at Gabes, a small sheep feeding project be done at Chenchou.

I strongly recommend that the Maktar project of the Oued Marguellil Project be reactivated. A meeting with the Mission Director, Minister of Agriculture, Agricultural Commissar of Le Kef, Mr. Hizem, Mr. Walke Mr. Majar, and Mr. Shallow is recommended. Buildings, equipment, fence paddocks, and drugs are all still there and can be used. The flock has deteriorated to 80 ewes. The good rams are still there from Ousseltia. I have been advised that hay from El Grine can be used there. The Commissar of Le Kef can get P.A.M. feed at subsidized prices. Everything is there to work with and it would be an excellent place to do a complete sheep project as previously envisioned in the Qued Marguellil Project.

At this time there are no Tunisian livestock engineers (Master degrees) working on the livestock project. There are Tunisian zootechnicians working on other projects in the country. I strongly recommend that some of these highly qualified personnel be added to the project immediately.

A bibliography of material pertinent to livestock production is included in this report.

IV. ROLE OF VETERINARIANS

The Tunisian Direction des Services Vétérinaire (DSV) has made great strides since the consultant left in January 1969. The service is going ahead with great plans for the fight against livestock disease.

The central organization is well manned and organization of disease campaigns are well conceived at La Rabta. In each gouvernorat, there are at least one or more veterinary centers manned by a veterinarian and two or more technicians. These men are obliged to perform the necessary government vaccinating campaigns as well as the day to day veterinary work of the region (see Bibliography item 9).

The consultant along with USDA/AID adviser, Dalton Comeaux, made a visit to each gouvernorat. We were much impressed with the high quality of the young men in the service. In 1967 and 1968 we had 23 Yugoslav veterinarians doing this work. It is most encouraging to see these men replaced by young, well-qualified Tunisians. We now have 37 Tunisian veterinarians in the country. The schedule calls for 31 more to be in service by 1976. These additional men will give much needed support to those already in the field.

There are 10 foreign veterinarians in the country working on bilateral projects.

The Tunisian veterinarians are graduates of Alfort, Toulouse, and Lyons in France; Bologna, Italy; and Germany.

USAID should send two or three young Tunisian veterinarians to the United States for intensive training in epidemiology (Tuberculosis and Brucellosis campaigns) and for know-how so much needed on regulatory work. Also a man could well be sent to study vaccine production and laboratory work.

Because the Tunisian economy loses an estimated 4,500,000 TD per year from livestock disease, the above facts are very important. Also the facts that the country is small, there is political stability, the borders are quite easy to defend, and livestock numbers are small make it an ideal country for regulatory work and preventive medicine campaigns.

The consultant feels proud to say that an excellent rapport exists between the Accelerated Livestock Production Project and the DSV. Dr. Kallal has been selected to act as Tunisian consultant to the project and has agreed to support the project by having his men in the field perform all regulatory work on the livestock project farms.

Every veterinarian visited was given a brief resume of the objectives of the livestock project and its goals. Without exception, each man assured us of his interest and support. This is particularly gratifying in the opinion of the consultant because no one in an area is more qualified to evaluate a farm, a flock, a herd, and a farmer than is the veterinarian. Each man assured us that, when the project wished, he would present for consideration two or more farms on which the project could have success.

The consultant recommends that, if personnel are added to the project, a veterinarian be added. It is known that without animal health, all other features of the project can come to naught. The addition of a veterinarian would give invaluable counsel and also would maintain the excellent rapport now established with the DSV.

HEALTH CALENDAR FOR SHEEP

January

Protect flocks against cold weather to prevent pneumonia.

February

1. Vaccinate flocks against Pox (Clavélee).
2. Continue to protect against bad weather.
3. Any ewes that are going to be sold because of age or sterility should be vaccinated against Enterotoxemia if they are going to be fed grain.
4. Worm flocks with thiabendazole.

March

1. Commence flushing ewes either with grain (300 grams per day) or cereal pasture.
2. Feed rams grain to prepare for breeding season.

April

1. Start breeding - put rams in about April 15.
2. Worm flock with thiabendazole.

May

1. Shear flock starting about May 1.
2. Vaccinate against Enterotoxemia at the first of the month.
3. Dip flock at end of shearing when weather is warm at end of May.

June

1. Take rams after ewes have gone through three heats.

2. Redip the flock, middle of June, especially if there is evidence of scab (Gale).

July

1. Protect animals against heat by pasturing from 4-5 a.m. till 9 a.m. and again 5 p.m. till 7-8 p.m.
2. Water flock twice daily.
3. Treat for lungworms with double dose of thiabendazole only if flock shows symptoms.
4. Supplemental feeding if necessary of cactus, hay, etc.

August

1. Continue supplemental feeding if necessary.
2. Redip if flock shows sign of scab.

September

Start of Lambing

1. Feed ewes with single lambs 250 grams concentrate daily. Feed ewes with twins 300 grams daily in two feedings. Separate ewes that have lambed.
2. Treat umbilicus of newborn lambs with Iodine.
3. Have shepherd care for orphans.
4. Mark, tag, identify lambs.

October

1. Continue supplemental feeding.
2. Worm flock with thiabendazole.
3. Protect lamb from cold night tempatures to prevent pneumonia.

November

1. Vaccinate flock against Enterotoxemia.

2. Worm lambs for tape worms if they show symptoms.
3. Worm dogs that work with the flocks for tapeworms.

December

1. Protect flock against cold weather to prevent pneumonia.

HEALTH CALENDAR FOR CATTLE

1. Vaccinate against Anthrax (Fievre Charbonneuse) in January. Repeat in 8 months.
2. Vaccinate against Foot and Mouth Disease (Fievre Aphteuse) in February or March. Repeat in 8 months.
3. Worm with thiabendazole two times yearly in April and October.
4. Protect cattle against Piroplasmosis by spraying barns and backs against ticks (once weekly starting in April and continuing until end of summer).
5. Protect calves against Brucellosis by vaccinating all females at 4-8 months of age with B-19 vaccine (dairy calves only).
6. Test for Tuberculosis annually (dairy herds only).
7. Test for Brucellosis annually.
8. Use the sterility program in dairy herds as indicated by the report in Appendix II.

APPENDIX II: INFERTILITY OF DAIRY CATTLE IN TUNISIA

SOME PROBLEMS AND SOME SOLUTIONS

CAUSES

There are many causes of infertility and sterility in cattle. One cannot say any of these causes are peculiar to Tunisia. A well-rounded, common-sense approach to the problem will give the same results in Tunisia as anywhere else in the world.

Environment

First, one has to give recognition to environment. In the space of the 2 years, 1967-68, the writer has examined many cattle in Tunisia. The majority were Holstein cattle imported and being kept in Northern Tunisia on cooperatives. When Holstein cattle are moved to Tunisia from a cold, wet country like the Netherlands and fed an entirely different kind of ration, it is natural that the animal undergoes stress. A long period of time is required to alleviate stress. Constantly changing the method of handling and stabling cattle, plus temperature and feed changes keeps them in a less-than-maximum productive and reproductive condition. During this transition period, infertility may result. Good care and management will reduce this infertility time to a minimum.

Inadequate Nutrition

Inadequate nutrition plays a large part in infertility of cattle in Tunisia. Local vetch and oat hay often is of very poor quality, low in protein, and very low in vitamins A and D. Feeding high quality green hay or adding vitamins A and D to the feed is necessary where one finds many cows with small inactive ovaries in the same herd. Anestrus is the clinical sign. Heifers and cows with small, inactive ovaries will benefit immediately from an injection of vitamin A and then a continuation of vitamin A in the feed.

The soil in Tunisia is high in calcium, and I believe that an imbalance may occur in the blood serum of cattle, resulting in a phosphorous deficiency. Phosphorous deficiency is known to cause sterility in dairy cattle. More work should be done in this field, with blood serum samples analyzed for phosphorous. Samples should be taken from problem cows and problem herds. Phosphorous should be added to the ration when there is a suspicion of a deficiency.

I visited herds where the cattle were too fat. It is again well known that overweight cattle, heifers especially, will be difficult to breed. In this case, cutting back on the amount of concentrates fed to the cattle is the answer.

Ovarian Crops Luteal Cysts

The incidence of Ovarian Crops Luteal cysts as a cause of anestrus was found to be very low. Probably we see more of this in very high producing cows. There simply is not a regression of the corpus luteum of pregnancy. Manual expression is simple and effective. Cows come into heat in 3 to 5 days and should be bred.

Follicular Cysts

Follicular cysts with resulting nymphomania were found very infrequently. Manual expression and administration of Chorionic Gonadotrophin is effective.

Pyometra, Metritis, Endometritis

Anestrus not caused by vitamin A deficiencies or Corpus Luteal cysts may be due to Pyometra, Metritis, or Endometritis. The cow's uterine physiology will not allow her to come into heat and conceive if infection is present in the uterus. Treatment consists of intra-uterine infusion of antibiotics and injection of drugs to empty the uterus of pus.

Cervicitis and Vaginitis

Cervicitis and Vaginitis are minor factors in sterility here. Topical treatment is indicated for this condition.

Brucellosis Infection

Brucellosis infection of course is a major cause of sterility. Every effort must be made to find infected cows. Blood testing must be routine and reactors isolated or disposed of. A good calf vaccination program is imperative for the control of the disease.

Difficult Breeders

The cow that cycles regularly, shows no pathology, and yet fails to conceive is indeed a problem whether she is in Tunisia or in some other country. Follicle stimulating hormone on the 17th day of the cycle has been helpful. Injections of vitamin A have been successful in some cases. Infusion of the uterus with antibiotics on the day of service and an injection of Estradiol has also worked well in some cows. One has to use common sense in evaluating the case and pursue the treatment that appears to be the most logical.

In problem cows that have been bred three times it is definitely advised that the veterinarian check the cow early in the heat and before service. Diagnosis and treatment is much easier and effective when done at this time.

SUCCESSFUL METHODS OF ATTACKING THE PROBLEM

The most important factors to ensure fertile dairy herds are: a good set of herd records, a capable herdsman, and a good relationship between the herdsman, local veterinarian, and artificial breeding technician. Records are vital for knowing heat dates, breeding date treatment dates, drying off date, etc. A good herdsman is absolutely necessary. He must know and understand cows and he must understand the fundamentals of dairy reproduction. Knowing when a cow is in heat, when to call the technician, and when to breed is in large part the backbone of a successful breeding program. Cooperation between veterinarian, technician, and herdsman is absolutely essential to getting the work done on time.

A herd health plan that has been found successful is described as follows:

1. A monthly visit by the veterinarian to each herd. At this visit examination is made of every cow fresh 30 days. If infection or pathology exist, treatment is given. This saves time in inducing pregnancy. Cows that have been bred 50 days are examined for pregnancy. If not pregnant, treatment is decided upon and administered. Anestrus cows promptly treated. Any other questions are discussed with the herdsman and corrective action taken on cases involving sterility. Records are examined and suggestions are made regarding changes in feeding, etc.
2. Regular blood tests are made for Brucellosis.
3. Calves are vaccinated against Brucellosis.

With the people of Tunisia needing more and more fresh milk and dairy products and with the increasing demand for food made by the hotel and tourist industry, it is imperative that all persons working with dairy cattle make every effort to become more efficient. One of the critical areas is infertility. It is hoped that seminars might be held at which questions and answers such as the ones in this paper can be discussed.

THIABENDAZOLE PROPOSAL FOR THE
ACCELERATED LIVESTOCK PRODUCTION PROJECT

On 12/29/72 the thiabendazole (TBZ) proposal was rediscussed with the Direction des Services Veterinaire (DSV), USDA/AID adviser Dalton J. Comeaux, and the consultant (Dr. Thomas). The proposal was put very simply; the Government of Tunisia would like the livestock project to furnish, in 1973, 400,000 doses of TBZ for treatment against internal parasites. All fattening cattle and all sheep on the farms under the direction of the livestock project would be treated (two treatments per year for cattle and three for sheep for a total of 93,000 doses). The remainder of the medicine would be used on farms agreed upon by the DSV and the project. It would be naive to think that all farmers would repeat vaccination and worming the next year. However, this project would allow the Government to greatly increase the number of animals treated.

It is acknowledged by all veterinarians and livestock people in Tunisia that internal parasites are the most important health problem affecting the national herds and flocks. This inflicts an estimated annual loss of 2,000,000 TD in sheep alone. The sheep census is 3 million head; of this total, 1 million were treated one time for worms in 1972 (using either TBZ, Phenothiazine, and Exhelm). Large private farmers treat their sheep at their own expense if they treat more than once. The DSV conducts a national campaign against both sheep pox (Clavelée) and internal parasites. First of all, sheep are vaccinated for pox. Upon presentation of a certificate of vaccination, the farmer receives worm medicine for the number of sheep he had vaccinated.

It is known that we can expect at least a 2 kg. gain from one worming, so the increase in GNP would be $400,000 \times 2 \text{ kg.} = 800,000 \text{ kg.}$ @ 0.500 TD per kg. = 400,000 TD or \$800,000. Expenditure of $0.030 \text{ TD} \times 400,000 \text{ doses} = 12,000 \text{ TD}$ or \$24,000 would realize a gross return of \$800,000.

All veterinarians visited throughout the country felt that using the pilot farms of the project plus other farms selected by them would result in a very good extension education campaign. Four benefits accrued from this:

1. GNP of the Tunisian economy would be increased substantially, i.e. by 400,000 TD and 800,000 kg. or 800 tons of meat.
2. The project, by using good husbandry and animal health measures, demonstrates a technique that lends itself to extension work.
3. The project obtains all sanitary health assistance from the DSV on all their pilot farms plus the consultation services of the DSV veterinarian.
4. If 20 percent of the farmers continue, in the years to come, the practice of vaccination and worming, the country as a whole will benefit.

The five gouvernorats of the north are now being used as the main area thrust of the project. By implementing the above TBZ proposal, a start could be made in each of the southern gouvernorats on one or two farms selected by the veterinarian in that gouvernorat. Each veterinarian whom we visited assured us that he could choose two or more like farms that would lend themselves to an extension worming and vaccination program. Thus, the way would be laid for future work in the center and south where the main part of the national sheep flock is located. In this way the project would get exposure in this geographical area with a minimum of manpower needed.

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