

## Chapter Twenty-nine

# Initiation of a National Brucellosis Control Program in Egypt

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Brucellosis in animals has been recorded in Egypt since 1939.<sup>1</sup> The prevalence of serological reactors on limited surveys has varied however from one author to the other. In cows it was reported to be 16.5%,<sup>2</sup> 18.8%,<sup>3</sup> 20%,<sup>4</sup> 22.2%,<sup>5</sup> and 23.3%.<sup>6</sup> The prevalence among buffaloes varied from 7 to 10%.<sup>1,4,7</sup> Isolations of *Brucella abortus* from cattle were made by various workers as early as 1943.<sup>8-10</sup> Since 1970, *Brucella melitensis* has also been isolated.<sup>11-14</sup>

During the 1960s, with the importation of Friesian cows for the establishment of governmental farms with large numbers of animals, the incidence of brucellosis in cattle reached 37% on some farms. This increase took on an alarming nature during the early 1980s with the increased creation of farms with large number of animals on relatively small areas of land.

The aim of the present work was to gain experience with the use of the reduced dose S19 vaccine in calves.

## Materials and Methods

During the years 1985 to 1987, 15,815 adult cattle on 16 farms in 6 governorates were tested periodically by the tube agglutination test and positive cases were confirmed by rivanol or complement fixation test (CFT). In 1988, a total of 29,823 cows, 809 buffalo, 3,355 calves, and 192 sheep in large farms were tested. In addition, 2,528 blood samples obtained from animals from small farms, markets, and abattoirs, and tested.

During the years 1987 and 1988, 8,709 calves, 3 to 7 months old, were vaccinated with the reduced dose S19 vaccine obtained from the United States. Before application of the vaccine, each batch was subjected to viability counts to be sure that the used dose (2 ml) was between 3 and 10 billion organisms.

## Results

### Serosurvey During the Years 1985 to 1987

As shown in Table 29-1, the prevalence of cattle with positive and suspicious titers animals reached up to 34% in some farms; however, this percentage dropped drastically following the slaughter of reactors. This is clearly demonstrated in Table 29-2 concerning Farm no. 7 in Damietta. This farm contained 980 imported Friesian cows. The percentage of reactors was very high (34.5%) when the animals were tested in March 1986. The gradual slaughtering of reactors almost cleaned up the farm so that the incidence at the end of the year was 9.2%. However, it increased again and reached up to 11.4%.

In Qena Farm no. 1 there were 590 imported Friesian cows. During December 1985, the rate of infection was 32.9%. Following the slaughter of reactors, the rate of infection dropped to 3.5%. Four of 50 persons working on the farm contracted the disease.

In one of the private farms in Sharkia, Friesian cows were vaccinated annually with H38 vaccine so that some animals received up to five doses. The serological testing of 446 animals revealed 317 positives and 64 suspicious animals. Titers of 1/40-1/320 (tube agglutination), 1/50-1/400 (Rivanol) and 1/40-1/160 (CFT) were obtained. Another private farm in the Giza governorate had a similar pattern.

### Calfhood Vaccination

Only calves proved to be serologically negative when vaccinated. The serological follow-up of the vaccinated calves revealed a variable pattern. In general, about 55% of the calves had agglutinins one month after vaccination. A titer of 1/10 was detected in 7%, 1/20 in 13.7%, 1/40 in 16.9% and 1/80 in 18%. Three months after vaccination, the calves showing titers between 1/10 - 1/40 increased to 62%; however, all animals tested negative seven to eight months after vaccination.

### Serosurvey in the Year 1988

As shown in Table 29-3, 1.6% of cows had positive reactions and 0.9% were suspicious. On the other hand, all 809 buffalo tested were negative. In calves, 2.6% were positive and 3.3% were suspicious. Sheep had high percentages (31.7% and 10.4%) of positive and suspicious samples. Table 29-4 demonstrates the absence of reactors in animals in abattoirs of three governorates (Damietta, Sharkia and Kalubia) and markets in Sharkia and Kalubia. Only one positive and three suspicious cases were detected among 1,731 animals owned by small farmers.

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Table 29-1. Incidence of *Brucella* Reactors in 16 Farms of Adult Cattle

<u>Farm</u>	<u>No. of Animals</u>	<u>First Report of Brucellosis</u>	<u>Percent of Reactors</u>	<u>Dates of Testing</u>
Quena 1	596	17.12.1985	32.9%	1985
			3.5%	1986
Quena 2	652	16.07.1985	0.4%	1985
Quena 3	195		0.0%	1987
G. Sami Assad	1,271	23.05.1982	0.5%	1986
			0.8%	1987
Damietta 1	1,067	10.03.1986	0.1-0.6%	1986
			0.2-0.3%	1987
Damietta 2	1,181	10.03.1986	0.8-0.0%	1986
			0.3-2.8%	1987
Damietta 7	980	10.03.1986	34.5-0.2%	1986
			0.22-0.0%	1987
Shalakan	137	8.12.1985	2.8%	1985
			3.4-14.0%	1986
			1.7-0.7%	1987
W. Shalaby	295	16.12.1986	21.3%	1987
El-Asakra	760	—	0.0%	1987
Abo-Gabre	4,687	17.07.1986	1.8-7.6%	1986
			5.1%	1987
El-Tounsy	2,806	21.10.1985	34.2%	Jan.-April, 1987
				Jan.-Nov., 1987
Labana	146	13.01.1987	23.4%	1987
El-Samanoudy	73	24.11.1985	16.4%	1985
El-Katta prison	120	4.03.1985	15.5-9.0%	1986
Touch Tanbesha	848	1969	83%	1984
			22.8%	1985
			6.8-6.2%	1986
			6.3-29.%	1987

## Discussion

Reviewing the literature concerning brucellosis in Egypt indicates that the disease was found at levels of 16 to 23% in cattle and 7 to 10% in buffaloes. However, during the sixties, with importation of Friesian cows, the prevalence on some farms became very high. In Touch Tanbesha, for example (Table 29-1), it reached up to 38% in 1984. Such a high incidence was observed only in farms with a large number of animals concentrated on relatively small amount of land.

Parallel with the open door policy in the late seventies and early eighties, there was a marked increase in the number of intensive breeding farms, both governmental and private. This was based on importation of

Table 29-3. Serosurvey of Animals in Large Farms in 10 Governorates

<u>Animals</u>	<u>No. tested</u>	<u>Positive</u>	<u>%</u>	<u>Suspicious</u>	<u>%</u>
Cows	29,823	573	1.6	289	0.9
Buffalo	809	-	-	-	-
Calves	3,355	85	2.6	112	3.3
Sheep	192	61	31.7	20	10.4

Table 29-4. Serosurvey of Farmers' Animals, Animals in Markets and in Abattoirs

	Cows	Result		Buffaloes	Result	
		+	±		+	±
Farmer's animals	878	1	3	853	—	—
Markets	152	—	—			
Abattoirs	158	—	—	487	—	—

c. Confusion among field veterinarians and herd owners about brucellosis control.

d. Shortage of vaccines and diagnostic reagents.

Accordingly, a National Brucella Committee was established representing the General Organization of Veterinary Services, Animal Health Research Institute, Animal Reproduction Research Institute, Serum and Vaccine Research Institute, and universities. Through this committee the following decisions were made.

1. It was decided to use U.S. reduced-dose S19 vaccine (3-10 billion organism per dose) in serologically negative calves, 3 to 7 months old. The adult vaccination (0.5 billion) was not approved, instead the adults were allowed to be vaccinated with the killed 45/20 vaccine. The application of S19 was planned initially to be used in selected farms in five governorates. Use of the vaccination was expanded in the first year to 28 farms and in the second year to 37 farms. All other vaccines are officially not allowed at present.

2. It was decided to use the buffered acidified plate antigen (BAPA) as a presumptive test. Positive samples were then tested with the tube agglutination and Rose Bengal (card) tests; Rivanol and, if possible, CFT were used as confirmatory tests.

3. For evaluation of the vaccine a titer follow up was suggested. Challenge experiments were not accepted. Calves should be negative before breeding age.

4. In dairy farms, the milk ring test (MRT) was to be applied to bulk milk tank samples every 3 to 4 months and positive herds were to be subjected to blood testing of individual animals.

5. Because of the increased volume of laboratory work in the central laboratory at Dokki, selected provincial laboratories were strengthened as far as possible with facilities and trained personnel so that they can carry out the screening tests.

6. To eliminate any confusion concerning brucellosis epidemiology and control, training courses for field veterinarians were conducted and a guide covering the most essential facets of brucellosis in cattle was printed and distributed.

7. All imported animals were to be kept in quarantines for at least 30 days. Pregnant imported animals should be negative when tested 14 days after calving. Herds containing even one positive animal were put under quarantine and all animals were to be subjected to periodical testing every 21 days. Quarantine measures were released if the animals pass three consecutive negative tests at 21-day intervals.

In our opinion, all these measures (namely, the periodical testing, slaughtering of positives, calfhood vaccination with the reduced dose S19, adult vaccination with 45/20, strict quarantine measures and testing of imported animals and infected herds) have led to the drastic drop in incidence of brucellosis in cattle and buffalo at some farms. In order to get better results, this system needs to be expanded to cover all governorates in Egypt.

The problem of a high incidence of *B. melitensis* infection in sheep and goats remains to be considered. This is alarming as *B. melitensis* has been recorded<sup>23,24</sup> to be predominant in the cattle and buffalo samples cultured in the last three years.

In our opinion, this situation requires, that more attention be given to sheep and goats with regard to testing, slaughtering, and vaccination to control the disease among them and to eliminate the potential spread of the infection from sheep and goats to cattle and buffalo.

More studies are needed to determine the role of S19 vaccine in protecting cattle from *B. melitensis* infection and to decide if *B. melitensis* vaccine such as Rev. 1 should be used.

## Summary

Before starting the application of the reduced dose S19 calftlood vaccination 15,815 adult cattle in 16 selected farms were serologically tested. The incidence of positive reactors reached 34% at some farms. The policy of test and slaughter and calftlood vaccination of calves in these and adjacent farms (8,709 calves in 29 farms) resulted in a drastic drop in the rate of positive reactors. Sheep and goats, which are not yet considered in the program, had a high incidence of reactors (31%). Isolation attempts with positive cattle and buffalo revealed the frequent recovery of *B. melitensis*. This finding suggests to us that sheep and goats, and possibly other animals should be included in the control program.

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