

EPIDEMIOLOGY AND CONTROL OF L. HARDJO IN THE NETHERLANDS

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Introduction.

In 1984 infections with *Leptospira hardjo* were first detected in dairy cattle and man in the Netherlands. In 1988 a program to monitor the infectionstatus of dairy farms was started.

Presented are our experiences with:

- bulk milk monitoring of *L. hardjo*
- the origin of detected new infections on farms
- an experimental controlprogram

Experimental design:

In 1987 an ELISA was introduced in the Netherlands for (bulk) milk and blood testing for *L. hardjo* antibodies. Because of a country wide monitoring program all dairy farms in Gelderland, the Netherlands were bulk milk tested. Since 1989 farmers were asked to financially participate in an extended monitoring program and have their bulk milk tested three-times a year.

The results of the monitoring are presented.

In spring 1991 149 dairy farms out of 6063 became bulk milk positive after having been free of the disease for some time (½-3 years). 31 farms participated in an investigation on the origin of these detected new infections. A questionnaire on farm management was completed by the dairy farmers and all milk cows were milk sampled and tested with the ELISA. Milk positive cows and dry cows were bloodsampled and tested in the ELISA.

If a voluntary certificate program for *L. hardjo* free herds should start in the Netherlands, infected herds should be offered the possibilities of a control program. An experimental control program was therefore started in 1988 on 22 dairy farms (infection rate > 50% infected animals based on blood ELISA results).

The program is based on a dihydrostreptomycin treatment of all animals at the beginning of the controlprogram (25 mg/kg body weight) and a vaccination regime. All animals are vaccinated in spring before turn-out to pasture. Youngstock born during the year is vaccinated in march or november (2x) and afterwards with the herd. The preliminary results over a 2 years period are presented, based upon bloodsamples for antibodies of all animals.

Results.

The results of the bulk milk monitoring on *L. hardjo* are presented in Table 1.

Table 1.
Infection status for *L. hardjo* on dairy farms in Gelderland, the Netherlands 1988-1991.

	1988	1989	1990	1991-I (abonnement)
NA	75,6%	80,0%	85,6%	96,8%
PA	14,2%	17,0%	12,6%	2,3%
DA + NI	10,0%	2,8%	1,8%	0,8%

NA = no antibodies detected; PA = positive for antibodies;
DA = doubtful reactions; NI = not investigated

The chance on a bulk milk test result - with 95% confidence interval - for farms with 5 earlier results known could be calculated from the results of individual farms (see table 2).

Table 2.
Chance and 95% confidence interval on a specified bulk milk test result for *L. hardjo* after five earlier test results are known.

1989-1	1989-2	1989-3	1990-1	1990-2	1990-3	chance %	CI 95%	N
-	-	-	-	-	-	99.5	± 0,2	3098
-	-	-	-	-	+ / ++	0.3	± 0.2	10
-	-	-	-	+ / ++	-	40.6	± 17.0	13
+	+	+	+	-	+			0
+	+	+	+ / ++	+ / ++	-			12
+	+	+	+ / ++	+ / ++	+	68.7	± 16.0	22
+	+	+	++	++	++	72.1	± 13.4	31

In spring 1991 31 dairy farms were tested bulk milk positive on *L. hardjo*, after having been free of the disease for some time and participated in an investigation on its causes. The results are summarised in table 3.

Table 3.

Results of the milk/blood tests on L. hardjo in individual dairy cows on farms which became bulk milk positive.

bulk milk history	N	test milk	test blood	result	remarks
1 -----	26	X	X	2 pos.	purchased cows
2 -----	27	X	X	1 pos.	purchased cow
3 -----	34	X	X	1 pos.	purchased cow
4 -----	50	X		1 pos.	purchased cow
5 ----+--		X	X	1 pos.	purchased cow
6 -----+	24		X	1 pos.	trader
7 +-----	51	X	X	1 doubtf.	from own farm
				1 pos.	purchased cow
8 -----	75	X	X	all neg.	purchased possibly
					pos. cows already sold
9 -+----		X	X	2 pos.	own beef cow, milked 3
					month/year
10 -----	47	X	X	1 pos.	purchased cow
11 -----+	13	X	X	1 pos.	purchased cow
12 -----	49	X		1 pos.	purchased cow
13 --.---	15	X		2 pos.	purchased cows
14 -----	56	X	X	2 pos.	purchased cows
15 TT..T--	36	X	X	1 pos.	own cow, was already
					found sero-pos. in '88
16 --.----	23	X	X	1 pos.	purchased cow
17 -----	38	X		1 pos.	purchased cow
18 -----	20	X	X	1 pos.	purchased cow
19 T-.---	25	X	X	1 pos.	purchased cow
20 -----	49	X	X	3 pos.	purchased cows
21 ---.---T	46	X	X	1 pos.	purchased cow
22 -----		X		all neg.	trader
23 -----	34	X	X	1 pos.	purchased cow
24 -----	63	X	X	1 pos.	purchased cow
25 G-----	104	X	X	5 pos.	own young stock, turned-
					out with other herds
26 G-.-.-.	49	X	X	all neg.	trader
27 +-----+	32	X		1 pos.	purchased cow
28 -----+	76	X	X	1 pos.	purchased cow
29 +-----	53	X	X	3 pos.	purchased cows
30 -+----	34	X	X	1 pos.	purchased cow
31 +-----	14	X	X	1 pos.	purchased cow

It could be concluded that herds became bulk milk positive after introduction of new cows. All purchased infected cows came from herds with positive bulk milk results or from herds where the farmer refuses to have his bulk milk tested. The number of L. hardjo positive animals was small, restricted to new cows. No spread of infection had yet occurred.

In 1988 an experimental control program on infected dairy farms was started. The results of the blood samples tested by ELISA for L. hardjo antibodies are presented in fig. 4.

START

AFTER 2 YEARS

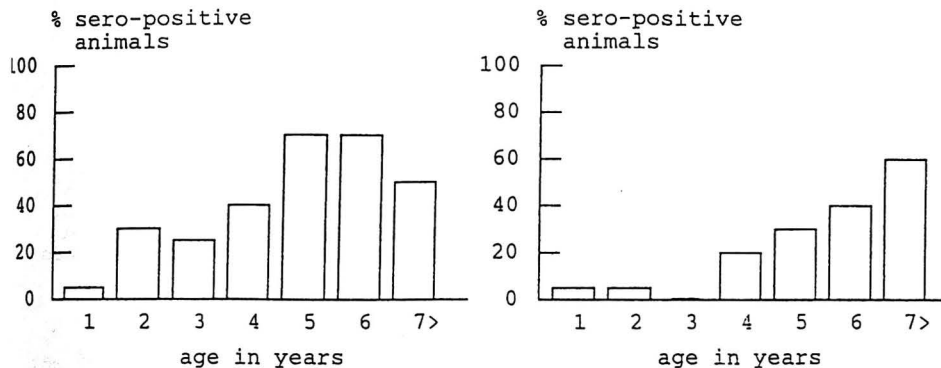


Fig. 4. The percentage *L. hardjo* sero positive animals per age-group at the start of the control program and after 2 years.

After 2 years the sero-positive animals for *L. hardjo* are mostly found in the age-group 4 years and older, indicating that because of the control program sero-negative animals and newborn youngstock stayed free of infection.

The percentage sero-positive youngstock in the 1st year of life was due to animals younger than 5 months because of colostrum antibodies.

The percentage sero-positive in their 2nd year of age may have been due to 3 vaccinations within 6 months (vaccination antibodies).

Conclusions

- * *L. hardjo* infections on dairy farms in Gelderland, the Netherlands, are diminishing, because of the awareness of farmers of the disease (slaughter of infected cows/purchase from *L. hardjo* free herds).
- * The most important source of infection on dairy farms in Gelderland, the Netherlands, is the introduction of purchased infected cows on the farm.
- * The experimental control program to eradicate *L. hardjo* infection from a farm by dihydrostreptomycine treatment and vaccination of all animals looks promising.