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## LEUCOSIS IN CATTLE IN THE NETHERLANDS

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### Résumé

LA LEUCOSE BOVINE AUX PAYS-BAS. — Il est certain que la leucose bovine enzootique n'a jamais été observée chez des bovins hollandais autochtones. Après 1965, par suite des règles communautaires européennes, l'importation de bovins des autres pays de la communauté devint plus facile et plusieurs cas de Leucose Bovine Enzootique ont été observés chez des animaux importés, et parfois ces bovins ont causé des enzooties dans des fermes hollandaises. Cet article rapporte les résultats des études faites sur la limitation de la maladie, et le système officiel d'éradication qui a été mis en place en mai 1977. L'historique de quelques cas est rapporté, ainsi que la politique d'éradication poursuivie par la nation et l'état actuel de la maladie.

Since 1923 about eight reports have been made in the Dutch Journal of Veterinary Medicine about incidental cases of leucotic tumours in cattle.

During the years 1960 until 1967 a systematic analysis was carried out by my colleague Dr. W. Misdorp on 600.000 slaughtered animals in which calves were also included. He found 13 times a leucotic tumour. This means 2.1 tumours in 100.000 head of slaughtered animals.

In the same period some other investigations were done. Dr. Misdorp collected 281 tumours from cattle from various slaughterhouses in which he found 18 leucotic tumours originating from adult cows and 8 tumours from calves. Also 37 cows and calves with

tumours were examined, 65 % of the cows were under 4 years of age and the classification of the tumours was as follows :

Congenital (tumour in new born calves)	3
Tumours in calves	5
Tumours of the thymus	18
Tumour in adults	8
Lymphosarcoma	3

Due to an individual identification system of the Dutch cattle used for the control of tuberculosis and brucellosis, it is possible in most cases of a tumour finding in the slaughterhouse, to trace back to the herd of origin. By tracing back up to now no herd with autochthonous Dutch cattle has ever been found in which there were one or more animals to be suspected of leucosis.

A group of cattle that is tested very carefully

for leucosis is the group that is exported for breeding purposes. The Netherlands are exporting annually about 30.000 to 40.000 head of this kind of cattle to E.E.C. countries and to so called third countries.

The export figures of breeding cattle over one year of age are :

	E.E.C. countries	third countries
1974	14.571	12.299
1975	24.962	12.923
1976	20.725	14.779
1977	17.753	14.005

Never over a long period of years has any animal been found in export cattle to be suspected of leucosis nor have there been any reports from abroad that leucosis had been found in imported cattle from the Netherlands.

So it can be stated that although some cases of sporadic leucosis have been observed, no indication of the existence of enzootic leucosis in originally Dutch cattle has even been seen.

The explanation for the fact that no E.B.L. appeared in the Netherlands lies in the strict import policy that was maintained during decades before 1965.

After 1965 due to E.E.C. regulations it was possible to import cattle from partner countries in a rather easy way. In the E.E.C. health certificate only a guarantee for tuberculosis and brucellosis was put down, although it was very well known that in some of the partner countries E.B.L. was present, the Netherlands were not allowed to demand a certain security with regard to leucosis because there was no official control system against leucosis i.e. a not existing disease. This has been a very clear error in the E.E.C. harmonisation policy of veterinary disease control.

The organisation of regional animal health services under the guidance of the National Animal Health Committee made a special record of all the imported cattle and started an investigation procedure of these animals. The procedure consisted of annual haematological investigation of the animals over two years of age during seven successive years.

Fortunately only a limited numbers of animals are imported. Annually, the average is not more than a thousand with a top of about

8.000 in 1973. Since that time the import of breeding cattle is decreasing again.

In the beginning there was quite some interest in Jersey cattle that were mainly imported from Western Germany. Later on the import of Jerseys decreased and more black-and-white and red-and-white cattle were imported from the same country. This was mainly due to the fact that in the years between 1965 and 1970 a lot of Dutch farmers changed the housing of their cattle from the tied system to the loose house system with attendant extension of the herd. There was a temporary shortage of breeding cattle at that time.

Also beef cattle from Southern Germany — Simmenthalers — and from France — Limousin and Charolais — were imported and over the last few years there is a growing interest in Holstein-Friesian cattle originating from Canada and the United States. Since direct import is not easy into the Netherlands these animals are going to some other E.E.C. partner countries where the demands about leucosis do not exist or are not very strict. This shows us another leak in the European veterinary policy.

The haematological investigations of import cattle had no legal background in the first years after 1965 and when a suspected or infected animal was found this could only be culled with the voluntary cooperation of the owner.

In 1968 the disease became officially notifiable and all the practitioners had to report all tumour cases in cattle. This also concerned all the veterinarians working in the meat hygiene control who had to report all tumours found in slaughter-animals.

In 1970 the first suspected animals were found. Out of the 253 cows that were haematologically examined fifteen showed a lymphocytosis most of which had a persistent character. Some of these animals were sent to the Central Veterinary Institute and pooled whole blood was injected into sheep. The test animals soon showed leucosis in optima forma. Thus the existence of E.B.L. in imported cattle was proved. In the following years some of the imported cows even showed tumours and now it was completely clear that E.B.L. has been brought into the Netherlands by importation after 1965.

Some time after, a draft regulation for the control of leucosis including investigation procedures was set up and offered to the Euro-

pean authorities in order to be approved. More than three years passed before the answer came that the proposed system did not fit into an eventual European control system. A new draft was set up and first put in operation before the European authorities were asked to allow the Netherlands to demand a certain guarantee for leucosis when cattle were brought into the country.

In the meantime it was May 1977 when the official control system started.

Only animals which can be certified as free of leucosis may be added to a herd. All the cattle of Dutch origin are considered to be free as so far they have not been in a herd with suspected or infected animals.

Imported animals and cows from a herd with a tumour finding are under observation and have to follow a investigation procedure. Contaminated animals, the off-spring of contaminated cows, animals with a tumour and imported animals without a certificate concerning leucosis are slaughtered immediately.

Animals from herds from which infected animals have been removed have to follow an investigation procedure of at least two years. An infected herd is blocked i.e. special isolation measurements are taken during the time of the investigation procedure.

So in principle we try to « cure » an infected herd. Only when quite a lot of infected animals are found sometimes a herd is stamped out as a whole.

In the period in which the eradication was done on a voluntary basis mainly the haematological test, carried out by the Animal Health Services, was used for the detection of an infected animal. Only in 1973 the serological tests, the I.I.F.T., the C.F.T. and the A.G.I.D.T. with p24 antigen were introduced and carried out by the Central Veterinary Institute. In 1976 the A.G.I.D.T. was done with gp 60 antigen.

In the official control system the serological tests, the I.I.F.T. and the A.G.I.D.T. are used for the diagnosis. The Animal Health Services are doing the A.G.I.D.T. and when there is no negative reaction the serum sample is retested by the Central Veterinary Institute with A.G.I.D.T. and I.I.F.T. The haematological test is done on seropositive animals only to « age » the infection.

Due to the fact that rather small quantities of animals were imported few positive animals

were found and fortunately only a small number had to be culled.

Year	Total number of culled animals
1970/71	21
1972	41
1973	43
1974	35
1975	155
1976	210
1977	204 (x)
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(x) 49 slaughtered before May (voluntary) and 155 slaughtered after the official regulations started.

Similarly the number of infected herds has always been correspondingly small. In 1971 there were 14 infected herds, and with some ups and downs through the years we have now come to 32 infected herds in 1978.

On 236 farms there are one or more animals under observation. 130 of them have imported cattle, 73 have bought cattle from herds that became later infected and 33 are under observation because of tumour findings.

As mentioned before the general policy of the control of leucosis is to « cure » infected herds. This policy is based on the following considerations :

1. The E.B.L. infections in Dutch herds are always young infections so in general the extension of the infection will be limited ;
2. Importation is mainly practised by the owners of the larger farms so stamping-out policy of whole herds for just one or two infected animals will be relatively very expensive and give unnecessary losses ;
3. With the modern serological methods it may be expected that infections can be detected at a stage when the risk of virus transmission is very low.

Nevertheless sometimes when a smaller herd is infected with a relatively large number of seropositive animals the slaughter of the whole herd must be considered for veterinary as well for economical reasons.

Of these group follows a sample : farm E/MV has a total of 49 animals (30 adult cows). The importation started in 1967 with 9

Jersey's from Denmark and Germany. Later more Jerseys were imported nearly all with certificates that were free or non-suspect for leucosis.

The diagnostic test results were :

1969, 1970 and 1971	(haem.)	0 pos.
1972	(haem.)	2 pos.
1973	(ser. p24)	1 pos.
1975	(ser. p24)	2 pos.
1976	(ser. gp60)	2 pos.
1977 Jan.	(ser. gp60)	5 pos.
1977 May	(ser. gp60)	9 pos.

After this last herd examination the whole herd was slaughtered. Was here a real explosion of the infection or was it due to the change of antigen that suddenly so many positive animals appear ? Was there horizontal transmission ?

In a second sample horizontal transmission of the disease can be shown.

Farm G/M. WW. has a total of 55 Dutch Friesians animals. In 1970 nine Jerseys were brought into the herd.

The diagnostic test results were :

1971	1 Jersey pos.
1973	6 Jerseys pos.
1974	7 Jerseys pos.
1975	3 Jerseys pos. and 8 Dutch Friesians
1976 Jan.	3 Jerseys pos. and 3 Dutch Friesians

In April 1976 the whole herd was slaughtered. In this case the explosion of the disease and the horizontal transmission from the Jerseys to the Dutch cattle is demonstrated clearly.

Another interesting sample of an infected farm in which the infection developed more « normally » is the following.

Farm P/A.U. has 70 Dutch Friesians. By accident this farm was examined in 1976 and 10 positive animals were found. The owner declared that the whole herd was home bred and that he never has purchased an animal. With hindsight it was evident that in 1966 two cows from Belgium and Germany were imported illegally.

The distribution of the positive animals was as follows :

- 1 out of 3 born in 1967.
- 3 out of 5 born in 1968.
- 1 out of 1 born in 1970.
- 1 out of 3 born in 1971.
- 2 out of 8 born in 1972.
- 1 out of 14 born in 1973.
- 1 out of 19 born in 1975.

In the beginning of 1976 the whole herd was slaughtered. It is obviously a quiet but nevertheless a sure development of the disease which shows us that within a period of 10 years 15 % of a herd can become infected.

Fortunately the experience with the majority of the infected herds is a little more reassuring. The normal picture is that an imported group shows positive results in rather a short time. After removing the positive animals the herd as a whole is negative and stays negative. Now we not yet have the experience that it stayed negative for over two years since our official eradication system only started in May 1977. But there is a good hope that the majority will stay negative until May 1979 and can be certified to be leucosis-free again.

There is just one case that is bothering us in this field. This can be demonstrated with the following sample :

Bull T., born in 1972,  
imported in 1973,  
periodical haematological test results all negative,  
serologically suspected in July 1977,  
E.B.L. diagnosis confirmed in September 1977.

If there are more such cases known it is necessary to go on with the control of imported animals for a very long time.

In connection with this it must be stated that in case of export or import the paper that certifies that the animals in question are free of leucosis is not based on one or two serological tests with negative results but on the whole herd history.

## Conclusions.

1. No enzootic bovine leucosis existed in the Netherlands before 1965.  
This is based on the statements :  
that although sporadic cases of leucosis had been observed no clusters of cases were ever found on a farm  
that tracing back from tumour findings to the herd of origin led to no findings of cases of leucosis, and  
that in exported cattle no leucosis was ever found, nor were there ever reports from abroad about leucosis in Dutch cattle.
2. E.B.L. was brought into the Netherlands by imported cattle after 1965.
3. It was an error in the European veterinary policy not to allow countries free of

- leucosis to demand a security against this disease.
4. The parameter of tumour finding in slaughtered animals has not any meaning in connection with E.B.L. incidence in the Netherlands.
  5. The reason that herds are tested after tumour finding has to be considered more as a random screening than as a need to detect E.B.L. in the country.
  6. It may be expected in a country with young infections that with the help of the modern serological tests the culling of recently seropositive animals is effective for the eradication of E.B.L.
  7. When cattle are exported the certificate about leucosis must not be based on one or more individual serological tests but also the herd history must be taken into account.

### Summary

It is stated with certainty that enzootic bovine leucosis never has been encountered in autochthonous Dutch cattle. After 1965 when due to E.C. regulations the import of cattle from partner countries was facilitated, several cases of E.B.L. were found in imported cattle and sometimes these cattle caused outbreaks on Dutch farms. A review is given of the control of the disease since that time and of the official eradication system that started in May 1977. Reports are given of some case histories, the policy of the eradication under the national circumstances and the status of the disease on this moment.