

## 1998 Veterinary report on African Wild Dog (*Lycaon pictus*)

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The African Hunting Dog is an endangered species. Diseases, large predators (lions), and man threaten its existence. Because of lack of game they tend to get close to human settlements. As a consequence they are poisoned and come in close contact with domesticated dogs. As the African Hunting Dog is extremely susceptible to diseases transmitted by the domesticated dog (distemper, rabies and parvo virus), many of them die, and die as a result of injection with these viruses.

It took many years and much searching before dens were finally located from which suitable pups could be collected for the Mkomazi project. It was most important that the pups came from a non-conservation area (Maasai Steppe), to prevent further, unnecessary, decline of numbers in the conservation areas. It was very likely that pastoralists would have poisoned them sooner or later anyway. Finally, the right moment arrived in early August 1995. Twenty-five pups were lifted from three different dens in the Maasai Steppe. At the time of lifting they were independent of their mother, that is to say they could eat solid food by themselves. They ranged in age from, approximately, three to five weeks.

According to the location where they were found, they were called the Lendanai group (sex 1.3), Llondirrigiss group (sex 7.1) and Najo group (sex 7.6). The pups were flown to Mkomazi Game Reserve (Kisima Camp) on 3 September 1995. For them, and the people involved, it represented a new start for the rescue of this subspecies East African Hunting Dog.

With the arrival of the dogs it was decided to collect as much data as possible from the dogs without bothering the dogs too much and with a minimum of interference in their behaviour. For these reasons blood samples were not taken on all occasions from all dogs. Pregnant females were left out from sedation as well as alpha females and alpha males as long as their pups were less than three months old.

This report is divided into two sections: Husbandry and Veterinary Work.

For continuity reasons (and to make this report more readable) sections of the 1997 veterinary report are incorporated in this report, as being still relevant.

### Husbandry – development of packs

The pups were flown into Kisima camp on 3 September 1995, and were kept separated, in the original litter formation. In December 1995, a transponder was inserted in the left side of the neck. It was now possible to identify them at all times. It was judged to be the right time to put the three litters together, and this happened on 21 December 1995. They settled themselves in a new social order without much quarrelling and lived happily together for the first nine months of 1996.

Breeding packs were then composed and the dogs were separated into three (and subsequently four) breeding compounds.

In August 1996 a request was received from the Kenya Wildlife Service (KWS) for four male dogs. KWS had recently captured a pack of four adult females with hunting experience, which had been stock raiding (sheep). Their intention was to add males to the pack and reintroduce the whole pack in the Serengeti-Mara ecosystem. With the permission of the Tanzanian Wildlife Department and the Serengeti Wildlife Research Institute, four males were sent to Kenya: Llondirrigiss 299, Najo 273, 288 and 303. Eventually the dogs were released in Tsavo West. The project proved to be a partial success. Richard Kock, at that time head of the veterinary department of KWS, wrote a report about the release. A copy of this report is available on request. To get a good overview of the development of the packs it is advisable to read the 1997 report first (available on request).

Development of the different breeding packs will be given per pack.

#### Lendanai pack:

On 1 February 1998 alpha female 262 gave birth to 7 pups. Najo 274 was their father. The pups started off doing very well. However on 28 April one pup died and on 19 May another pup died. A third pup was noted being sick on 22 May. This pup fortunately recovered after medical treatment (see [Clinical Work](#)). After this bad episode, the remaining five pups grew up well without any problems. By the end of 1998 the total number of dogs was 10 and Lendanai 262 showed signs of pregnancy again.

#### Sangito pack:

By the end of 1997 the dogs had still not decided which dogs were going to be the alpha female and male. By early 1998 they had made up their minds. Alpha female was Najo 306 and alpha male Llondirrigiss 294. As a result, on 3 May Najo 306 gave birth to 8 pups. On 27 May one pup died; on 6 July two pups died and on 14 August a fourth pup died. After this nasty period the remaining four pups grew up well. What happened? Initially the alpha female and male looked after their pups very well. After a month the pups started to come to the top of the den to receive regurgitated food from their parents. This went well for a couple of days. Suddenly, one day, a fight broke out between the father, 294, and one of his brothers 291. Apparently 291 was after the mother 306. Fighting went on for a week. To make things even more complicated; mother 306 went off during this period with the third brother 289. Father 294 took control of looking after the pups. All pups were still healthy and well at this stage. Whilst he was caring for the pups, the fight between him and his brother 291 died down, but mother 306 and her new suitor 289 now started fighting him! Apparently, as a result, he did not feel confident enough, to leave the pups on their own and to come and take food from the feeding compound to feed himself and the pups. This happened in the time that the two pups died (6 July). At that time feeding was started near the top of the den, exclusively for 294 and the pups. Fighting stopped and male 289 assumed alpha position. The pups grew up well, but one pup died on 14 August. At the end of 1998 the pack consisted of 11 dogs.

#### Kisima pack:

After the alpha female Llondirrigiss 297 died in October 1997, the alpha male, Najo 300 looked after the pups of the first litter. He did not bother to engage in the struggle for leadership, and perhaps withdrew as in the wild to allow one of his sons to establish himself as the alpha male. However, the sons were very young and in the interim period before they

reached adult age, three males and two females struggled for alpha positions. (The Lendanai male 263 did not involve himself in the positioning). The males Llondirrigiss 293, 296 and 298 went for alpha, but it was not clear which one was the real alpha. The same could be applied to the struggle of the females, Najo 284 and 285. As a result, 284 gave birth on 9 May and 285 on 1 June. Apparently 285 took her pups down in the den of 284. Over the next two days there was a fight in the den. The first opportunity to look in the den was on 6 June but there were no signs of the pups of 285. Over the next three months 284 and 285 were continuously fighting. During this time, the litter of 284 did not once come up to the top of the den for food. This is highly unusual as pups usually come up once they are one month old for regurgitated food. Apparently the pups lived only on their mother's milk during these months, which is not enough and they slowly died one by one. One can only guess what the reasoning was for the pups refusal or inability to come out. However it is likely that the alpha position was not quite settled with both females and males and, as a consequence, neither father nor mother took full responsibility for the pups, in contrast to what happened in the Sangito pack. At the end of 1998 there were 9 dogs left in this pack.

#### Ayubu pack:

In October the male Lendenal 263 and the females Kisima 336, 337 and 339 were separated from the Kisima pack to form a new breeding pack. They were placed in the newly built Ayubu boma and settled down soon fairly well. At the end of 1998 the Ayubu pack consisted of these four dogs.

It is possible that some of the dominance problems experienced in the Mkomazi breeding packs followed the mixing of the three original litters, when the pups were approximately 5 months old. Until then they had lived in separate compounds. The combined litter lived then together until February 1997 when the individuals were approximately 19 months old. At that time Llondirrigiss 297 and Najo 300 had established a firm alpha position. Following the splitting in 3 breeding packs, the newly formed packs had to establish a new alpha pair. It took some time for the males in the Sangito compound to sort out a new dominance hierarchy and during this transition period the unusual behaviour was observed. After the death of Llondirrigiss 297 in the Kisima compound, Najo 300 could no longer maintain his male alpha status and he became a subordinate male, who raised his own pups without assistance once his mate had died. Subsequently the remaining males and females had to establish a new dominance hierarchy, which caused the unusual behaviour.

## Husbandry – Zootechnique

### 1. Composition of packs

Lendanai	Llondirrigiss	Najo
261F	289M	265F
262F	291M	273M
263M	293M	274M
264F	294M	275F
	296M	276F
	297F	284F
	298M	285F
	299M	288M
		300M
		303M
		305M
		208F
		310M
1:3	7:1	7:6

F= Female

M= Male

Najo 273, 288, 303 and Llondirrigiss 299 went to Kenya

Llondirrigiss 297 died October 1997

At the end of the year 1998 the packs were composed as follows:

Boma 1 – Kisima pack

Males	Females
Llondirrigiss 293	Najo 276
Llondirrigiss 296	Najo 284
Llondirrigiss 298	Najo 285
Najo 300	
Kisima 333*	
Kisima 335*	

\* Born 4th March 1997

Number of dogs: 9, sexes 6.3

Alpha dogs: positions unclear

### Boma1 II: Lendanai pack

Original animals: males	Females
Najo 274	Lendanai 261
Najo 310	Lendanai 262
Najo 298	Lendanai 264
Lenjo 322*	Lenjo 323*
Lenjo 325	Lenjo 327
Lenjo 329	

\* Born 01/02/98

Number of dogs: 10, sexes 5.5

Alpha dogs: Female 262 and Male 274, through 1998

### Boma1 III: Sangito pack

Original animals: Males	Females
Llondirrigiss 289	Najo 265
Llondirrigiss 291	Najo 306 (275)
Llondirrigiss 294	Najo 305
Sangito 352*	
Sangito 355	
Sangito 358	
Sangito 359	

\* Born 03/05/98

Number of dogs: 11, sexes 7.4

Alpha dogs: Female 306 and Male 294, early 1998; Female 306 and Male 289, end of 1998

### Boma1 IV: Ayubu pack

Males	Females
Lendanai 263	Kisima 336*
	Kisima 337*
	Kisima 348 (339)*

\* Born 4th March 1997

Number of dogs: 4, sexes 1.3

Alpha dogs: by the end of 1998 time was too short to settle the alpha female position.

Lendanai 263 of course is alpha male

NB. Please refer to the 1997 Veterinary Report for further information on the breeding groups.

## 2. Identification

Every time an animal was sedated, the transponder was checked. They were all working in good order except Kisima 339. In October 1998 it appeared that the reader was not reading her transponder. It was not possible to locate the transponder manually, so it was decided to bring in a new transponder number 348. In total two transponders have failed by now.

The Lenjo pups received their transponder in October 1998, numbers ending with 322, 323, 325, 327 and 329.

The Sangito pups received their transponder in October 1998 as well, numbers ending with 352, 355, 358 and 359. All transponders started with the letters and numbers NLD 093500110 followed by the 3 numbers to identify each animal.

As an extra way of identification, photographs were taken from both sides of the dogs in lateral recumbency. This happened to the Lenjo and Sangito pups for the first time and to the Kisima pups for the second time, as they were not full-grown at the time the first photographs were taken.

## 3. Housing

In 1998 the three bomas of the dogs were not altered. A fourth boma was built to house the Ayubu pack. This boma was built exactly the same as the two bomas in 1997. For details see Report 1997.

## 4. Nutrition.

There was no reason to alter the feeding of the dogs in 1998. For details see Report 1997.

## 5. Bodyweight (See Appendix I)

It was only possible to measure the bodyweight of the dogs when they were sedated. They were weighed during each sedation. The original dogs show the next, average, bodyweights in the course of time:

Bodyweight in kilogrammes

Date	Age (approx)	Male	Female
19/12/95	5 months	10.1	9.5
29/02/96	7 months	12.8	11.13
09/03/97	1year 7months	22.9	18.5
15/10/97	2 years 3 months	25.7	19.2
15/02/98	2 years 7 months	24.7	18.4
04/10/98	3 years 3 months	25.7	18.8

Although the number of dogs is not the same at every date of weighing, one might conclude that the average bodyweight for dogs above two years of age is 24-25 kg for males and 18-19 kg for females.

The Kisima pups showed the following development of bodyweight:

Date	Age	Male	Female
15/10/97	0.5 month	17.4	15.4
15/12/98	1 year	22.3	20.1
04/10/98	1 year 7 months	23.0	21.0

It is interesting to note that the male pups have the same average bodyweight as the original male dogs at the same age (1 year 7 months). However the female pups are 2.5 kgs heavier on average.

The Lenjo and Sangito pups showed the following average bodyweights (weighed on only one occasion):

Date	Age	Male	Female
15/10/97	Lenjo pups 8 months	16.6	16.8
15/10/97	Sangito pups 5 months	12.3	

## Veterinary work - preventative medicine

Preventative medicine is the most important part of the work and takes the most time. It is far better to prevent diseases than to cure diseased animals, particularly in the given situation whereby many animals are kept in relatively close confinement and contagious diseases will spread easily.

The most dangerous diseases to the dogs are distemper, rabies and parvo virus infections. A programme is developed, in which the dogs are vaccinated against these diseases. In addition their blood is taken on a regular basis to study the effect of the vaccinations, which makes it possible to alter the vaccination schedules according to the results. Vaccination policy and results will be discussed in the chapter on Vaccinations.

Another important part of preventative medicine is the prevention of parasites, which will be reported and discussed in the chapter on Parasites.

### 1. Vaccinations

The African Hunting Dog is extremely susceptible to diseases like distemper, parvo and

rabies. Little is known about the effect of vaccinations. The purpose of vaccinating the dogs in the first place is to protect them against the above-mentioned diseases and, in the second place, to study the effects of the vaccinations on the African Hunting Dog. As a common rule only inactivated (killed) vaccines were used for two reasons: to prevent spreading of viruses in the field and to prevent ill side effects in the dogs.

Distemper – see Appendix II

As there is no commercially available inactivated distemper vaccine, Prof. Osterhaus, Department of Virology, Erasmus University Rotterdam, kindly donated the vaccine. The problem with the CDV-ISCOM vaccine is that it should be kept frozen until prior to use. It was decided to vaccinate the dogs in the first year, with a 14 and 30 day interval between the first and second vaccination and second and third vaccination. These three initial vaccinations were to be followed by an annual booster vaccination.

In December 1995 and early 1996 the dogs were vaccinated three times. One month after the vaccination they had already showed a promising resistance (see Veterinary Report 1996). However, one year after the last vaccination (March 1997) it appeared that the quantity of neutralizing antibodies was only sufficient in 5 out of 19 dogs. At the time the blood sampling was done, the dogs received their annual booster vaccination. In October 1997 another neutralizing antibodies test was done. This time none of the dogs showed a sufficient antibody level. Also, the Kisima pups born in March 1997 did not develop enough antibodies after three vaccinations.

Two reasons for failure were considered: 1) the way the vaccines were kept in the bush and 2) the possibility that an improper batch of vaccines had been used. Much to our surprise the neutralizing antibody testing in February 1998 showed that 12 out of the 13 dogs tested had enough antibodies. They were not vaccinated in the year in between! At this moment we don't have an explanation for this. In February 1998, a new batch of distemper vaccine was used, which showed immediately in the results in October. All dogs were well protected. Apparently the failure of the vaccinations in 1997 was due to the batch used. Also, the annual booster vaccination was replaced from February to October for practical reasons, which meant that the dogs were vaccinated twice this year, in February and October.

Without any vaccination, the Sangito pups proved to be well protected. According to their age, five months, this might be due to maternal immunity.

The measuring of the antibodies was performed with a 2 log titer instead of a 3 log titer, which explains the slightly different results in October 1998.

Rabies see Appendix III

Initially the expectation was that one single annual vaccination would be sufficient to protect the dogs against rabies. However, two and a half months after the first single vaccination serum was collected and antibodies tested, it showed that not a single dog developed sufficient antibodies (see Veterinary Report 1996). Therefore it was decided to vaccinate the dogs three times in 1997, the



second vaccination one month after the first and the third vaccination six months after the first. Antibody testing would be performed approximately one month, five months and 12 months after the third vaccination. One month after the last vaccination (October 1997) antibodies were tested in 22 dogs by Prof. Osterhaus, Department of Virology, Erasmus University, Rotterdam. Due to the shortage of vaccines, nine dogs received only two vaccinations; 13 dogs received the full three vaccinations. Except for one dog (Llondirrigiss 297) all 13 dogs, which received three vaccinations, showed sufficient antibodies, more than 0.5 IU. From the 9 dogs, who received two vaccinations, only one (Llondirrigiss 291) showed more than 0.5 IU. All the Kisima pups, having received only two vaccinations, showed less than 0.5 IU. The interim conclusion was that three vaccinations according to the above mentioned schedule, resulted in sufficient antibodies against rabies in the African Hunting Dog and two vaccinations did not, one month after the last vaccination. In February 1998 antibodies were tested in 18 dogs. Except for one dog (Kisima 333), all dogs showed more than 0.5 IU. For 13 dogs it was approximately five months since they received their last\* vaccination. In October 1998 antibodies were tested in all dogs, this being the time that a year had passed since most dogs received their last\* rabies vaccination, with the exception of the Kisima pups who had received the last\* vaccination 10 months before. (\* last = 3rd) The original dogs and the Kisima pups were 25 dogs in total. Only four dogs showed less than 0.5 IU. All the Lenjo pups showed more than 0.5 IU two months after their second vaccination, which is remarkable. In 1997 none of the Kisima pups had more than 0.5 IU two months after the second vaccination. There were only two different circumstances. Firstly, the Kisima pups were one month younger and, secondly, the Kisima pups were vaccinated with Dohyrab\*, while the Lenjo pups were vaccinated with Rabdomun\*\*. It was not surprising that the Sangito pups showed less than 0.5 IU having received no vaccination at that time.

Time-lapse after third rabies vaccination:

	1 month	5 months	12 months
Number of dogs >0.5 IU	12 (92%)	13 (100%)	17 (85%)
Number of dogs <0.5 IU	1 (8%)	0 (0%)	3 (15%)

Conclusion: The African Hunting Dogs in the breeding programme in the Mkomazi Game Reserve (Kisima Camp) are well protected against rabies after 3 vaccinations. According to the vaccination schedule: second vaccination one month after the first and third vaccination six months after the first

These results encourage us to continue to give the adult dogs one single annual booster vaccination and the pups three vaccinations in the first year of their lives, according to the schedule above, followed by one annual booster vaccination.

Vaccine used:

\* Rabdomun® (Schering-Plough)

\*\* Dohyrab® (Solvay Duphar) original dogs

\*\*\* original dogs

## Parvo virus infection and leptospirosis

The vaccination policy for parvo virus infection and leptospirosis is as follows: two vaccinations in the first year with a month in between. In the second and following years, a single booster vaccination annually. This policy has proven to be effective. However, in the future antibody levels will be measured occasionally to make sure that these vaccinations stay effective.

Vaccination dates: 19-12-95, 15-2-96, 9-3-97, 16-2-98 and 4-10-98.

Vaccination dates Kisima pups: 28-6-97, 2-8-97, 16-2-98 and 4-10-98.

Vaccination dates Lenjo pups: 27-6-98, 12-8-98 and 4-10-98.

Vaccination dates Sangito pups: 4-10-98 and 4-11-98.

In 1998 the original dogs and the Kisima and Lenjo pups received an extra vaccination in order to move the annual vaccination from February to October.

Vaccine used Dohyvac® I-LP (Solvay Duphar)

## 2. Parasites

### Endoparasites

As in the past years, faeces were removed from the bomas two times a day to prevent re-infection. The adult dogs received an anthelmintic, Drontal Plus\*, one tablet per 10 kg bodyweight, every three months. In October 1998, 10 faeces samples were collected at random and fixed with 5% formaldehyde solution. The samples were checked at the University of Utrecht, Department Parasitology & Tropical Veterinary Medicine. All samples proved to be negative

The pups were also given Drontal Plus\*, one tablet per 10 kg bodyweight every month, as soon as they started to eat solid food not regurgitated by their parents. This schedule was followed until the pups were 8-9 months old, because it was not possible to separate them any longer at feeding time.

\* Drontal Plus® (praziquantel, pyrantel embonaat, febantel), Bayer.

### Ectoparasites

On each occasion of sedation, the skins of the dogs were checked for parasites. There appeared to be no signs of fungus or scabies. No fleas or ticks were found up until September 1998, when there was a sudden outbreak of fleas in the Lendanai boma. This happened in the Sangito boma as well later on.

Initially the dogs were treated with Frontal\*, by way of spraying them, while the dogs were walking through the passageway in the bomas. In October a programme was started with Program\*\* 409 mg per dog, to prevent the fleas from multiplying. Every month the dogs receive one tablet of Program\*\* 409 mg through their food. From October 1998 on, at every occasion of sedation Advantage\*\*\* is applied in their neck to kill the fleas. This was done to all the dogs in October.

Also in October the first ticks were found. The ticks were preserved on a 96% alcohol solution and were sent for identifying to the University of Utrecht, Department Parasitology & Tropical Veterinary Medicine. The ticks were identified as nymphs of *Haemaphysalis leachii*, an important vector for pathogen protozoa.

\* Frontal® (fipronil), Rhone Merieux

\*\* Program® (lufenuron), Novartis

\*\*\* Advantage® (imidacloprid), Bayer.

## Veterinary work – clinical

### 1. Health problems

Two pups in the Lendanaï compound were found dead, without signs of illness, in April and May. After consultation by telephone it was decided to administer Synulox\* and dexamethasone intramuscularly to the diseased pup. Next morning the pup showed improvement and subsequently recovered completely. All pups received Synulox\* in their food for five days and the pups showed no signs of illness after that. There was no opportunity to treat the pups that died in the Sangito boma.

\* Synulox® (amoxicillin, clavulaan acid), Pfizer.

### 2. Sedation

The drugs used were Domitor\* and ketamine HCL. Antisedan\*\* was used as an antidote for Domitor\*. The drugs were administered by blowpipe, intramuscularly, in the hindquarters. For that purpose the dogs were enclosed in the passageway. The passageway was divided into small compartments, with two or three dogs per compartment, to avoid confusion during the darting process. As in the past years the dogs received, in general, 1.0 ml Domitor\* per 10 kg bodyweight, topped up with 0.1 ml ketamine HCL per dog, independent of their bodyweight. The smaller dogs (<20 kg) received 1.5 ml Antisedan\*\* and the bigger ones (>20kg) 2.0 ml Antisedan\*\* immediately after the procedures with them were finished. This combination still proves to be very satisfactory for purposes such as taking blood samples, applying transponders, measuring their bodyweight etc.

Induction time varied from 5 to 15 minutes. Some dogs had to receive an extra 0.5 ml Domitor\*, due to the fact that these few had worked out how to remove the syringe before it was completely emptied. Recovery time was 3 to 5 minutes, with only slightly more side-effects from the ketamine HCL, due to the earlier administration of the Antisedan\*\*. These very light side-effects disappeared within 30 minutes.

\* Domitor® (medetomidine hydrochloride 1 mg/ml), Pfizer

\*\* Antisedan® (atipamezole hydrochloride 5 mg/ml), Pfizer.

## Veterinary work – pathology

No autopsies were performed in 1998. No adult dog died. It proved to be impossible to remove the dead pups from the boma in time.

## Summary

In 1995, the George Adamson Wildlife Preservation Trusts, through the Ministry of Natural Resources and Tourism and the Department of Wildlife, started a breeding programme for the African Hunting Dog (*Lycaon pictus*) in the Mkomazi Game Reserve in Tanzania. A survey is given of the original dogs, composition and an update of the development of the breeding packs. The development of bodyweight of the dogs is described.

Preventative medicine is emphasized. In order to protect the dogs against infectious diseases, they were, as before, vaccinated against distemper, rabies, parvo virus infection and leptospirosis. To establish the effectiveness of the vaccinations, antibody testing was continued. Three rabies vaccinations, one month between the first and the second and five months between the second and the third, proved to be successful. The results of the distemper vaccinations were promising in 1998, and research is continued. We continued using the combination of Domitor® and ketamine HCL for sedation, which proved to be a safe combination once again.

## Appendix 1 - body weight in kilograms

Identification	Sex	Date of birth	19/12/1995	29/02/1996	09/03/1997	15/10/1997	15/02/1998
			kg	kg	kg	kg	kg
Lendanai	261	F		12	13.1	20.5	
Lendanai	262	F		11.1	12	19	
Lendanai	263	M		13.3	14.5	23.3	25.5
Lendanai	264	F		12.4	14.1	21	
Llondirrigiss	289	M			13.7	22	24.8
Llondirrigiss	291	M		9.2	11.9	20.2	26.5
Llondirrigiss	293	M		10	12.7	22	22.5
Llondirrigiss	294	M		10.5	14	25	28
Llondirrigiss	296	M		10	10.8	23.5	
Llondirrigiss	297	F		9.1	13		22
Llondirrigiss	298	M		11.1	15.5	25.5	27
Llondirrigiss	299	M		10.5	14.3	Kenya	
Najo	265	F		8.1	9	17.2	19.5
Najo	273	M		9.1	10.5	Kenya	
Najo	274	M		9.8	12.4	22.5	
Najo	276	F		8.7	10.5	17.5	15
Najo	284	F		8.1	9.8	16.5	15.8
Najo	285	F		8	9.5	17	15.9
Najo	288	M		10.1	12	Kenya	
Najo	300	M		9.8	11.8		23
Najo	303	M		9.7	11.9	Kenya	
Najo	305	F		9.5	11.2	19	22.3
Najo	306	F		9.2	11.5	18.5	20.8
Najo	308	F		9.3	10.7	19	22.5
Najo	310	M		8.8	11.8	22	
Kisima I	333	M	04/03/1997				17.8
Kisima I	335	M	04/03/1997				17
Kisima I	336	F	04/03/1997				14.5
Kisima I	337	F	04/03/1997				15.7
Kisima I	348	F	04/03/1997				16.1
Lenjo I	322	M	01/02/1998				
Lenjo I	323	F	01/02/1998				
Lenjo I	325	M	01/02/1998				
Lenjo I	327	F	01/02/1998				
Lenjo I	329	M	01/02/1998				
Sangito I	352	M	05/03/1998				
Sangito I	355	M	05/03/1998				
Sangito I	358	M	05/03/1998				
Sangito I	359	M	05/03/1998				

04/10/1998

kg

19.6
19.6
23.3
21.2
24
22.7
23.8
25.6
26.5
17.1
23.7
18
18
17.9
22
19.2
18.9
19.3
22.3
24
22.1
20.6
21.3
21
14.7
16.5
17
17.2
18
11.7
12.7
12.7
12.2

## Appendix II - distemper antibody level (VNT)

		19/12/1995	29/02/1996	09/03/1997	15/10/1997	15/02/1998
Identification	Sex	D-O NT-titer	D-O NT-titer	D-O NT-titer	D-O NT-titer	D-O NT-titer
Lendanal	261 F	540/++	20/±	20		
Lendanai	262 F	20/+	60/+	<20		
Lendanai	263 M	540/++	60/+	<20	<20	20/+
Lendanal	264 F	<20/-	60/+	20	<20	
Llondirrigiss	289 M	20/-	<20/-	<20	<20	20/+
Llondirrigiss	291 M		180/+	20	<20	20/+
Llondirrigiss	293 M	<20/-	60/+	<20	<20	
Llondirrigiss	294 M		20/±	<20	<20	20/+
Llondirrigiss	296 M		60/+	20	<20	
Llondirrigiss	297 F		<20/-		<20	died
Llondirrigiss	298 M		20/±	<20	<20	20/+
Llondirrigiss	299 M	180/+	60/+	Kenya		
Najo	265 F	20/-	20/±	20	<20	20/+
Najo	273 M		60/+	Kenya		
Najo	274 M		<20/-	<20		
Najo	306 F	60/+	60/+	<20	<20	20/+
Najo	276 F		180/+	<20	<20	20/+
Najo	284 F		60/+	<20	<20	20/+
Najo	285 F		180/+	<20	<20	<20
Najo	288 M		540/++	Kenya		
Najo	300 M	60/+	20/±		<20	20/+
Najo	303 M	<20/-	20/±	Kenya		
Najo	305 M	20/-	60/+	<20	<20	20/+
Najo	308 F		20/±	<20	<20	20/+
Najo	310 M		60/+	<20		
Kisima	333 M				<20	<20
Kisima	335 M				<20	20/+
Kisima	336 F				<20	<20
Kisima	337 F				<20	20/+
Kisima	339 F				<20	<20
Lenjo	322 M					
Lenjo	323 F					
Lenjo	325 M					
Lenjo	327 F					
Lenjo	329 M					
Sangito	352 M					
Sangito	355 M					
Sangito	358 M					
Sangito	359 M					

Vaccination dates Lendanal, Uondingiss and Najo dogs: 19-12-1995, 3-1-1996, 14-2-1996, 9-3-1997, 15-2-1998

Vaccination dates Kisima dogs: 28-6-1997, 2-8-1997, 27-9-1997, 16-2-1998, 4-10-1998.

Vaccination dates Lenjo pups: 27-8-1998, 12-8-1998, 10-9-1998, 4-10-1998.

Vaccination dates Sangito pups: 4-10-1998, 4-11-1998, 10-2-1998.

Neutralizing antibodies were tested. 20 and up means well protected.

04/10/1998

D-O NT-titer

40  
40  
20  
40

80  
80  
20  
40

40

80

20  
80  
20  
20  
80

80

20  
20  
40  
80  
40  
40  
40  
20  
40  
20  
40  
40  
80  
80  
80  
80  
20

, 4-10-1998.



### Appendix III - rabies antibody levels

			29/02/1996	09/03/1997	15/10/1997	15/02/1998	04/10/1998
Identification	Sex	I.U.	I.U.	I.U.	I.U.	I.U.	I.U.
Lendanai	261 F	0	<0.5				>0.5
Lendanai	262 F	0	0.5				>0.5
Lendanai	263 M	0	>0.5	>0.5	>0.5	>0.5	>0.5
Lendanai	264 F	0	>0.5	>0.5			>0.5
Llondirrigiss	289 M	0	<0.5	<0.5 *	>0.5	>0.5	>0.5
Llondirrigiss	291 M	0	<0.5	>0.5 *	>0.5	>0.5	<0.5
Llondirrigiss	293 M	0	>0.5	>0.5			>0.5
Llondirrigiss	294 M	0	<0.5	<0.5 *	>0.5	>0.5	<0.5
Llondirrigiss	296 M	0	<0.5	>0.5			>0.5
Llondirrigiss	297 F	0		<0.5	died		
Llondirrigiss	298 M	0	<0.5	>0.5	>0.5	>0.5	>0.5
Llondirrigiss	299 M	0	Kenya				
Najo	265 F	0	<0.5	>0.5	>0.5	>0.5	>0.5
Najo	273 M	0	Kenya				
Najo	274 M	0	<0.5				>0.5
Najo	306 F	0	<0.5	>0.5	>0.5	>0.5	>0.5
Najo	276 F	0	<0.5	>0.5	>0.5	>0.5	>0.5
Najo	284 F	0	<0.5	>0.5	>0.5	>0.5	>0.5
Najo	285 F	0	>0.5	>0.5	>0.5	>0.5	>0.5
Najo	288 M	0	Kenya				
Najo	300 M	0		>0.5	>0.5	>0.5	<0.5
Najo	303 M	0	Kenya				
Najo	305 M	0	>0.5	>0.5 *	>0.5	>0.5	>0.5
Najo	308 F	0	<0.5	>0.5	>0.5	>0.5	>0.5
Najo	310 M	0	>0.5				>0.5
Kisima	333 M			<0.5 *	<0.5	>0.5	>0.5
Kisima	335 M			<0.5 *	>0.5	>0.5	>0.5
Kisima	336 F			<0.5 *	>0.5	>0.5	>0.5
Kisima	337 F			<0.5*	>0.5	>0.5	>0.5
Kisima	348 F			<0.5 *	>0.5	>0.5	<0.5
Lenjo	322 M						>0.5*
Lenjo	323 F						>0.5*
Lenjo	325 M						>0.5*
Lenjo	327 F						>0.5*
Lenjo	329 M						>0.5*
Sangito	352 M						<0.5
Sangito	355 M						<0.5
Sangito	358 M						<0.5
Sangito	359 M						<0.5

\*Two times vaccinated at the time of testing (15-10-97).

Vaccination dates: 19-12-95, 9-3-97, 9-4-97 (except nos 289, 291 and 305, which received the vaccin

Vaccination dates Kisima pups: 28-6-97, 2-8-97, 10-12-97 and 4-10-98.

Vaccination dates Lenjo pups: 27-8-98, 12-8-98 and 4-10-98.

Vaccination dates Sangito pups: 4-10-98 and 4-11-98.

Resistance against rabies is measured in International Units (I.U.).

0.5 I.U. and up means well protected.



ation on 15-10-97 instead of on 22-9-97) and 4-10-98.