Problems of health and well-being among Dutch Labrador Retrievers; Implications for breeding policy

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1. Breeding policy

The Netherlands Labrador Association (NLV) ranks among the breed clubs that since long place health and well-being of their breed high on their agenda. For many years now the Club Board and the Breeding Committee have been putting great effort in health standards for breeding stock, in order to render the risk of breeding dogs with hereditary deviations or disorders as small as possible. In spite of this, though, we must conclude that the occurrence of health and well-being problems in the Labrador Retriever is impressive. Some of this will become evident below.

The fact that we find ourselves in such straits is not really surprising. From the very start of pure-bred breeding (around 1900) the sport has almost exclusively made use of a breeding method best described as 'inbreeding and selection'. The approach practised was 'line breeding' (a mitigated version of inbreeding), the result of which is that not only the desired genes are concentrated in one's breeding stock, but also the hereditary predisposition for undesired properties. The moment that hereditary deviations and disorders appeared in the line the breeder would move to select against them. Pitfall of the method is that invariably only a very small part of the problems present in the breeding stock become visible in the progeny. The effects of the majority of undesired characteristics are not noted until after many generations. Moreover, hereditary problems involving complex patterns of transmission can hardly be countered via individual selection.
In the early days of the 20th century, when breeding was still small scale, this was an acceptable breeding method. A breeder who encountered problems in his line brought in 'new blood' from a nearby colleague, thus introducing enough genetic diversity - hence leeway to select - to continue his line breeding. The essence of this method of breeding is: successive cycles of depletion of genetic diversity in a line over a number of generations and, every time that problems can no longer be contained, (partial) restoration of diversity. This went wrong when mobility increased and the scale of our breeding expanded. Increasingly, breeders obtained their new breeding stock from the same (champion) lines, and all those initially still separate inbred lines intermingled. Slowly but surely these lines all came to share the same ancestors. We reduced genetic variety within the breed as a whole. A breeder who needed new blood for his line was left with no place to turn to.
Due to over-use of too limited a number of breeding animals every generation again lost part of the breed's genetic variety and the level of inbreeding increased hand over fist. And as the level of inbreeding climbed we were confronted with explosive eruptions of disorders transmitted relatively simply (such as eye disorders and epilepsy), while health and well-being problems involving more complex modes of inheritance (like most dermatological and limb problems) were sneaking up on us as well.
For many breeds we have by now crossed a threshold - the level of health problems has become unacceptable. The Labrador Retriever happens to be one of them.

For other domestic and agricultural animals, too, 'inbreeding and selection' flourished during the first decades of the 20th century. It flourished because in the early phase (small-scale) inbreeding yielded some obvious advantages. After World War II, however, the scale of animal husbandry expanded and things changed. Farmers were confronted with the disadvantages of overly rigorous application of this system. In the purest-bred (the most inbred) animals productivity lagged. Farmers were forced to take another look at their

breeding policy. The fact that authors such as Willis and Padgett even now continue to sing the uncritical praises of ‘inbreeding and selection’ is utterly amazing. They have failed to understand the essence of the developments in those other species. To be sure, as dog fanciers we are not interested in production. We can be content with somewhat smaller litters and, well, we are not intent on meeting targets of maximum milk yield or growth rate, are we? But we do owe it to our dogs that they go through life with sturdy vitality. Our dogs have the right to live a life with minimal health problems and optimal well-being.
Breeders of agricultural animals are directly dependent on the proper functioning of all the physiological systems their animals have. They became aware of the weakness of the breeding method they had been implementing once farm-economically important statistics slumped. To them this was a signal that their animals were losing vitality.
In traditional dog breeding this recognition did not gain ground until a phase later. We did not use measuring systems able to inform us about the quality of the basic physiological functions of our dogs. We did not notice that the percentage of dogs with problems kept climbing just a little with every next generation. It was only when the problems of health and well-being took on unacceptable proportions that people started to become conscious of this theme. Some, like the authors referred to, seem to be blissfully ignorant still.

If we want to reverse the development of increasing lack of health and well-being in our pure-bred dogs, we will have to take a number of measures. We will have to formulate rules to prevent a further rise of the inbreeding level and put an end to its most important cause: over-use of too few breeding animals.
Formerly the breeding policy in a breed was the sum total of breeding decisions by individual breeders; now we will have to see how much room to manoeuvre we have within the breed. That room will then have to be divided among breeders (distributed over the available breeding animals). In concrete terms this means that limits have to be placed on the use of breeding animals. A ‘top sire’, until now permitted to spread his fine genes within the breed at will, shall under the new ruling be restricted in the number of litters he is allowed to produce. Not so as to thwart his owner or the breeders; simply because of the fact that this male unavoidably carries, along with the good, also a large number of harmful genes. Actually, in this respect the top sire is no different from any other random male in the breed.
Over-use of the good genes of a dog always goes together with an equal spread of bad genes. There is no escaping this; the next generations will become increasingly homozygous for the characteristics carried by this dog. Not only for the desired ‘superior’ characteristics, but also for the genetic misery he spreads.

It seems that within the NLV a group of breeders is prepared to battle tooth and nail to retain the old liberties. They claim that the breed is so marvellously healthy that no limitation on the use of breeding stock (especially males) is needed. Even worse, so they hold, this kind of measures would dramatically bring down the ‘quality’ of our Labrador. They plead for continuation of the present breeding method of ‘inbreeding and selection’ - ‘for the sake of preservation of healthy Labradors’.
Against this background we have little choice but to present once again the findings of a recent health survey in the Dutch population of Labrador Retrievers. This time meant for a broader general discussion and somewhat more explicit. It will at least open our eyes to the consequences of the past fifty years of ‘inbreeding and selection’. It will open our eyes also to the actual health of our ‘healthy’ Labradors. In this way, and completely in line with NLV policy pursued to date, concern with the health and well-being of dogs will be given its rightful place in our joint decision making.

2. Some general data

In 1998 the NLV Board decided to initiate a general inquiry into the experiences of club members with their Labradors. The objective was to gather information on the basis of which the club’s breeding policy could be evaluated and, if necessary, adjusted. To implement this

decision the *Labrador Post* of December 1999 contained a questionnaire in which owners were asked about their dog's weal and woe. The response was impressive: for no less than 2,123 dogs, aged 0 to 16, information was obtained, contributing to a picture of the current Labrador Retriever population in The Netherlands. The NLV gratefully acknowledges all those owners who demonstrated so much involvement with 'their breed' that they went to the trouble of meticulously filling out the questionnaire and returning it.

Before we discuss the results of this survey we must mention some limitations. The survey addressed NLV members, and the results of the inquiry therefore relate (almost exclusively) to that part of the Dutch Labrador population that belongs to NLV members. A second limitation of this inquiry is that the questionnaire focussed on dogs still living. About dogs that at the time of questionnaire distribution were no longer alive, and concerning their ailments or cause of death this survey provides us with no information. This means that the percentages on disorders are under-estimated. Thirdly, some questions were phrased such that a clear distinction between the responses 'No' and 'No answer' could not always be made. Because of this, again, the results here given represent an under-estimation of the factual values.

Age distribution

The questionnaire yielded information concerning dogs varying from age 0 to 16. The data was processed per age group of 1 year (Table 1). Because the groups of the oldest dogs were very small the dogs of age 11 and older were placed together.

Table 1. Age distribution of the dogs in the questionnaire

Age in years	Number of dogs	% of total
0-1	93	4.4
1-2	342	16.1
2-3	379	17.9
3-4	289	13.6
4-5	227	10.7
5-6	184	8.7
6-7	153	7.2
7-8	102	4.8
8-9	100	4.7
9-10	60	2.8
10-11	73	3.4
11+	121	5.7
Total	2123	100.0

Colour selection

The characteristics of a population (of a breed) can be changed by selecting against unwanted characteristics, or by selecting in favour of desired ones. But room to select is almost always limited. If we exclude dogs (or select them) because of one characteristic, we are left with fewer dogs to exclude (or select) for other reasons. That is, we cannot realise all our breeding objectives simultaneously; in our selection we have to assign priority to the matters we consider most important.
It appears that for a number of years now the colour brown (chocolate) is a highly desirable characteristic among Labrador breeders and Labrador owners (also within the NLV). With the help of purposeful selection breeders managed to increase the percentage of chocolates from just a few per cent in the period prior to 1990 to more than a quarter of the dogs born around 1999 (see Table 2 and Figure 1). Because selection latitude happens to be a scarce good within any population, this selection in favour of the colour chocolate must have been at the cost of selection in terms of other characteristics.

In discussions with breeders about this, some stridently deny that fashion-conscious (market-oriented) breeding is involved. They prefer to cling to the noble thesis that breeders of pure-

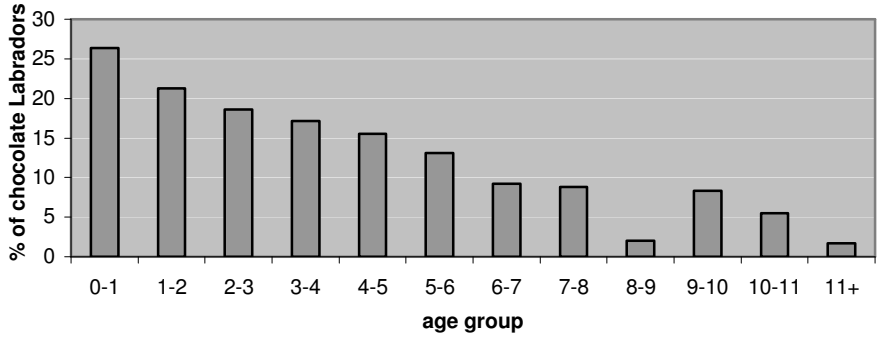
bred dogs always exert all their selection efforts (purely) in the interest of the breed. Health and well-being, those are their professed breeding aims.

Table 2. Distribution of coat colour in the age groups

Age	Black		Yellow		Chocolate		Total
	Number	%	Number	%	Number	%	Number
0-1	43	47.3	24	26.4	24	26.4	91
1-2	184	54.3	83	24.5	72	21.2	339
2-3	185	49.1	122	32.4	70	18.6	377
3-4	150	52.4	87	30.4	49	17.1	286
4-5	129	57.1	62	27.4	35	15.5	226
5-6	113	61.7	46	25.1	24	13.1	183
6-7	96	63.2	42	27.6	14	9.2	152
7-8	63	61.8	30	29.4	9	8.8	102
8-9	51	51.0	47	47.0	2	2.0	100
9-10	29	48.3	26	43.3	5	8.3	60
10-11	35	47.9	34	46.6	4	5.5	73
11+	70	58.3	48	40.0	2	1.7	120
Totaal*	1148	54.4	651	30.9	310	14.7	2109

*For 14 dogs no colour was indicated.

Figure 1. Percentage of chocolate Labradors per age group



In the context of this survey (information is given concerning living dogs only), there is one possible other explanation for the difference in proportion of chocolate Labradors over the years. If in every year the proportion of chocolates born was roughly the same (which would mean that the colour was not especially selected for), then the data would force us to conclude that chocolates die considerably younger. For now we will not assume this to be so; the earlier explanation, i.e. breeders are consciously opting for chocolate, seems more likely.

The data gathered on these 2,123 dogs gives insight into a large number of characteristics and traits of the Dutch Labrador population. To present all of these would overtax the allotted space here. The unabridged results of this survey will be published in a report now in preparation. In the light of the current discussions regarding breeding, however, it is worthwhile to take a modest preview, especially in relation to the theme of health. We will discuss a number of items that may be of immediate relevance in the framework of the new breeding regulations.

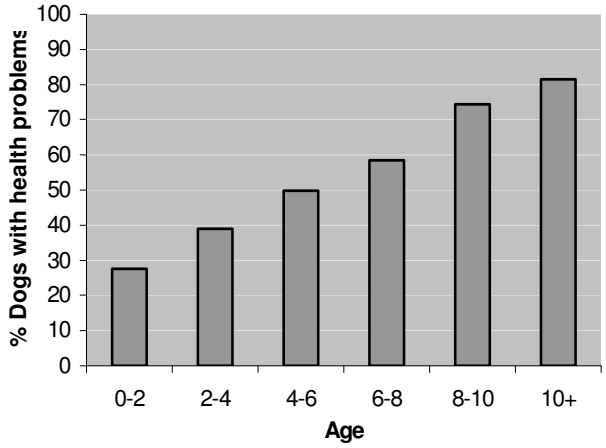
3. Some aspects of health

The survey included the question whether or not the dog ever had health problems. In Table 3 the numbers and percentages are given per age group. The questions covered the complete range of small, relatively harmless health complaints up to and including serious, life-threatening disorders.

Table 3. Health problems, numbers and percentages

Age	Yes	%	No	%	Total
0-1	19	20.4	74	79.6	93
1-2	101	29.5	241	70.5	342
2-3	128	33.8	251	66.2	379
3-4	132	45.7	157	54.3	289
4-5	103	45.4	124	54.6	227
5-6	102	55.4	82	44.6	184
6-7	87	56.9	66	43.1	153
7-8	62	60.8	40	39.2	102
8-9	72	72.0	28	28.0	100
9-10	47	78.3	13	21.7	60
10-11	58	79.5	15	20.5	73
11+	100	82.6	21	17.4	121
Total	1011	47.6	1112	52.4	2123

Figure 2. Percentage of Labrador Retrievers with health problems



The percentages in Table 3 under-estimate the factual situation. First of all because often no distinction could be made between 'No' and 'No answer'; more importantly because the dogs that meanwhile had died were not included in the survey. This holds for all results that are to be given below. That is to say, the figures present a picture that is somewhat more optimistic than the real state of affairs warrants.
To get some idea whether the percentages found should be considered 'high', we compare the results for the Labrador Retriever in the age range between 4 and 8 with the corresponding values found in breeds for which the health surveys have meanwhile been completed.

Dermatological problems

In recent years Labrador Retrievers are increasingly reported to suffer from skin and coat disorders. It appears that in a large number of cases Atopia is involved, a hereditary disorder related to insufficiencies in the immune system. Most dermatological disorders imply a serious lack of well-being: itch, pain and discomfort. Often the dogs aggravate the condition, wounding themselves by repeated scratching, and suffer from the resultant infections and inflammations.

Table 4 offers an overview of dogs with skin and coat problems in this survey. The fact that the percentage of stricken dogs seems to decrease some in the older age groups is probably due more to early death than to improvement in the situation of the dogs.

Table 4. Dermatological problems; numbers and percentages

Age	Yes	%	No	%	Total
0-1	4	4.3	89	95.7	93
1-2	33	9.6	309	90.4	342
2-3	38	10.0	341	90.0	379
3-4	48	16.6	241	83.4	289
4-5	39	17.2	188	82.8	227
5-6	38	20.7	146	79.3	184
6-7	26	17.0	127	83.0	153
7-8	25	24.5	77	75.5	102
8-9	23	23.0	77	77.0	100
9-10	10	16.7	50	83.3	60
10-11	16	21.9	57	78.1	73
11+	24	19.8	97	80.2	121
Total	324	15.3	1799	84.7	2123

To make a comparison with the situation as it pertains in other breeds we must consider the dogs aged between 4 and 8. In this group of 666 dogs we find 128 dogs with skin and coat problems. That comes to **19.2 per cent** of this age group! We must note that this is an under-estimation; in reality this percentage is higher. This places the Labrador Retriever among the breeds with the greatest problems of this kind! Some people dismiss skin and coat problems in the breed with the statement that for all animal species, including humans, dermatological disorders are becoming more widespread. This is supposed to be due to ‘our present-day environment’. This is true. Still, as long as there are also dog breeds in which this type of problem remains limited to 5 or 7 per cent of the population, we have good reason to worry about the frequency among Labrador Retrievers.

Limbs

Problems with the limbs, from ‘difficult start’ to complete lameness, are highly detrimental to the well-being of the dog (and the owner). In our pure-bred dogs we encounter a series of disorders, each of which causes its own pattern of pain and reduced well-being.
In Table 5 a review is presented of the occurrence of limb problems among the dogs in this survey. Here again, it seems as if there is some improvement in older dogs, and again it is likely that the ‘worst cases’ have died, either naturally or because of the owner’s intervention.

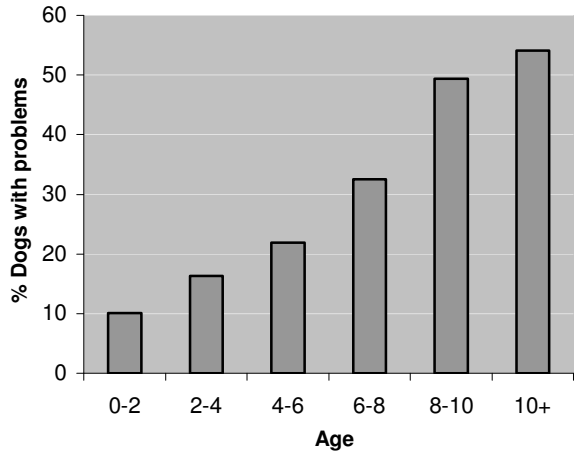
Table 5. Problems in the category Limbs; numbers and percentages

Age	Yes	%	No	%	Total
0-1	7	7.5	86	92.5	93
1-2	37	10.8	305	89.2	342
2-3	54	14.2	325	85.8	379
3-4	55	19.0	234	81.0	289
4-5	38	16.7	189	83.3	227
5-6	52	28.3	132	71.7	184
6-7	43	28.1	110	71.9	153
7-8	40	39.2	62	60.8	102
8-9	43	43.0	57	57.0	100
9-10	36	60.0	24	40.0	60
10-11	42	57.5	31	42.5	73
11+	63	52.1	58	47.9	121
Total	510	24.0	1613	76.0	2123

Of the group of 666 dogs in the age range of 4 to 8, there are 173 dogs suffering from disorders in the limbs; this amounts to **26.0 per cent** of this age group! As noted above, the true extent of the problems is under-estimated here. This makes the Labrador Retriever the

breed with the highest percentage of limb problems of the breeds so far surveyed in The Netherlands. The percentage exceeds that of the molossian breeds**,** generally considered as leading this particular procession.

Figure 3. Percentage of Labrador Retrievers with limb problems



In the total research group of 2,123 dogs relatively high percentages were found for some specific disorders: cripple (20.3%), OCD (4.5%), LPC (6%), Enostosis (2.6%), Hip dysplasia (3.6%) and Arthrosis (8.1%).

Nervous system

In recent years there are increasingly frequent reports of epilepsy and phenomena similar to epilepsy in Labrador Retrievers. For this reason the questionnaire contained explicit questions about this. The results are presented in Table 6. The diminishing percentage of 'affecteds' from age eight upwards is once again likely caused by mortality.
The majority of the reported cases for this item (164 out of 169 dogs) relate to epilepsy or phenomena reminiscent of epilepsy. For the total research group we arrive at 8.0 per cent having problems in the category Nervous System. This places the Labrador Retriever alongside the breeds that score highest on this type of disorder.

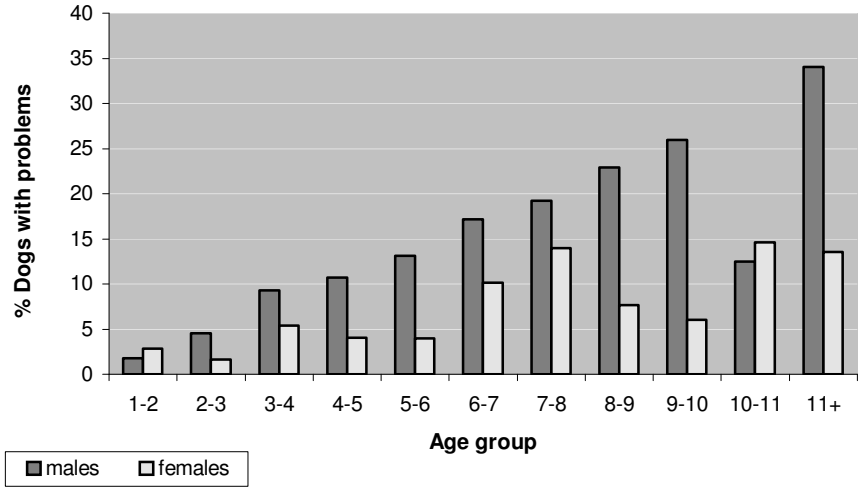
Table 6. Problems in the category Nervous System, numbers and percentages

Age	Yes	%	No	%	Total
0-1	0	0.0	93	100.0	93
1-2	8	2.3	334	97.7	342
2-3	12	3.2	367	96.8	379
3-4	21	7.3	268	92.7	289
4-5	16	7.0	211	93.0	227
5-6	15	8.2	169	91.8	184
6-7	20	13.1	133	86.9	153
7-8	17	16.7	85	83.3	102
8-9	15	15.0	85	85.0	100
9-10	9	15.0	51	85.0	60
10-11	10	13.7	63	86.3	73
11+	26	21.5	95	78.5	121
Total	169	8.0	1954	92.0	2123

There is an evident difference in the frequency of occurrence in males (10.5%) and females (5.6%). In males we note that the percentage of affecteds increases per year group in an almost straight ascending line, while the females display a more stepwise progression**.** Further research will have to provide us with an explanation for these phenomena and, more important still, offer insight in what breeding policy is most appropriate under these

conditions. A difficulty here is that in every life stage new affecteds are added, so that selection will require more advanced methods (genetic risk calculations).

Figure 4. Percentage of Labrador Retrievers with nervous system disorders, per gender and per age group



Within the group of 666 dogs in the age range of 4 to 8 we find 68 dogs with problems in the category Nervous System, which brings us to **10.2 per cent** for this group. This makes the Labrador the absolute leader in this category. While all the other researched breeds combined reveal an average of 3.5%, the Labrador scores three times higher!

Other categories

Next to the categories named above a number of biological systems reveal disorders and diseases that affect the well-being of Labrador Retrievers. The inquiry yielded the following numbers of dogs having problems in the category Eyes and Vision: 134 dogs (6.4 per cent); in the category Ears and Hearing: 111 dogs (5.5 per cent); and in the category Genitals: 91 dogs (4.3 per cent). This last category especially is of interest. Of the 67 bitches reported here, 66 suffer (or suffered) from uteritis; this amounts to 6.0 per cent of all bitches in the survey.

Other problems occurring in the breed are in the context of this discussion of less immediate import. To be sure, at some point in the consultations regarding a balanced breeding policy, they will need to be taken into account. The more so because some of these disorders, at present still relatively rare, may in the (near) future develop into the next round of breed-specific problems.

Acquired via the breed club

Of the 2,044 dogs in the research group that had been purchased, 719 were and 1.325 had not been acquired via the NLV puppy service/info (the remaining dogs had been kept on by the breeder).
A comparison of the extent to which health problems occurred in these two groups did not demonstrate that dogs obtained via the breed club suffered fewer health problems.

4. Where do we go from here?

In our discussion on the new NLV breeding regulations we have come to a point none of us wanted to reach. The point at which we of necessity had to demonstrate that there is indeed a pressing need to re-evaluate again critically the breeding policy for the breed, and in particular to halt the rapidly increasing rate of inbreeding. The question is, do we need to present more proof (which is available), or can we now, together with all breeders of

Labrador Retrievers, join hands and seek solutions? We have come to the present situation because the weapons we were using to fight the hereditary problems of health and well-being were woefully inadequate. We became caught up in this war because of the views breeders adhered to (some still do). This was a war that could not be won, in spite of all the good intentions of breeders and in spite of the tremendous effort of eking out the best of the breed. The impact of inbreeding (read: the loss of genetic diversity) on the spread of hereditary dispositions for undesired characteristics is many times greater than the limiting influence we can exert with our selection. We are left with no alternative: we simply must adjust our breeding policy (our population management).
In addition to this we shall have to deploy complementary instruments of selection. In breeding programmes for other animal species use is made of advanced methods (such as breed value assessment and genetic risk calculations). Such methods will be of great help in pushing back the hereditary problems in our dogs as well. If we are to put such instruments to effective use we shall first have to straighten out our population management. If we don't, we'll continue our fruitless attempt to bail out a sinking ship.

The results of the survey summarised here relate almost exclusively to Labrador Retrievers owned by NLV members. Perhaps some hold the illusionary hope that the Labradors of non-members fare better. There is not a shred of evidence to support this; the Labradors of both organised and unorganised breeders and owners together constitute one single population and one single gene pool. They share the same problems of health and well-being.

Then, too, we have the 'grey circuit' of 'look-alikes'. In a popular (marketable) breed like the Labrador Retriever that circuit is very big. This is a population of 'pure-breds' bred without pedigree, but blessed with a permanent influx from the registered population. Here again, we can hardly expect fewer problems of health and well-being. The basic difference for these dogs, hailing from the same gene pool, is that essentially not a single breeding and selection criterion is in force, and that nobody organises a health survey for them.

In conclusion
For those who despair of the possibility that the problems encountered can be overcome, we have an encouraging thought. In breeding the point of no return is almost never reached, a solution can always be found. The only condition is that breeders, together, are prepared to take the measures necessary to halt current developments now and next to turn them around. Let those who have a heart for the Labrador Retriever speak.

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Ms Janneke Scholten collaborated in the processing and analyses of the survey data.

Source: Labrador Post Vol. 38 No. 2, April 2002