"The times they are a-changin'"[1]

When I entered the dog world in 1981, it was completely different from what it is now. What has changed, why did it change and what are the consequences? And which tools are available nowadays to support us? Here, I will discuss the history in the Netherlands as I see it. Many events and trends are however similar in other West European countries. I will illustrate this article with screenshots of the Dutch database.

Retrospection

In the 80's most clubs had breeding rules, but the focus was more on type than anything else. Show results and titles were considered to be major components to improve the breed. Attention for health issues was limited to hip dysplasia. In the 70's many dogs had HD grade ± (comparable with C nowadays), or even + (HD D). Still, these animals were used in breeding programs. But in our country, a breeding restriction for dysplastic dogs without pedigrees for its offspring was not held upright in court. Because of that court ruling, breeders always received pedigrees. It made the clubs rather helpless and powerless.

When I look back, I think one series of events has been game-changing: bite incidents. These incidents started to happen so often in the 90's which such severe casualties, especially with some breeds, that newspapers started to report on them, action groups geared up against abuses and other negative things, and the government had to act. The scope of these actions widened fast from temperament problems to excessive, exaggerated looks in certain breeds.

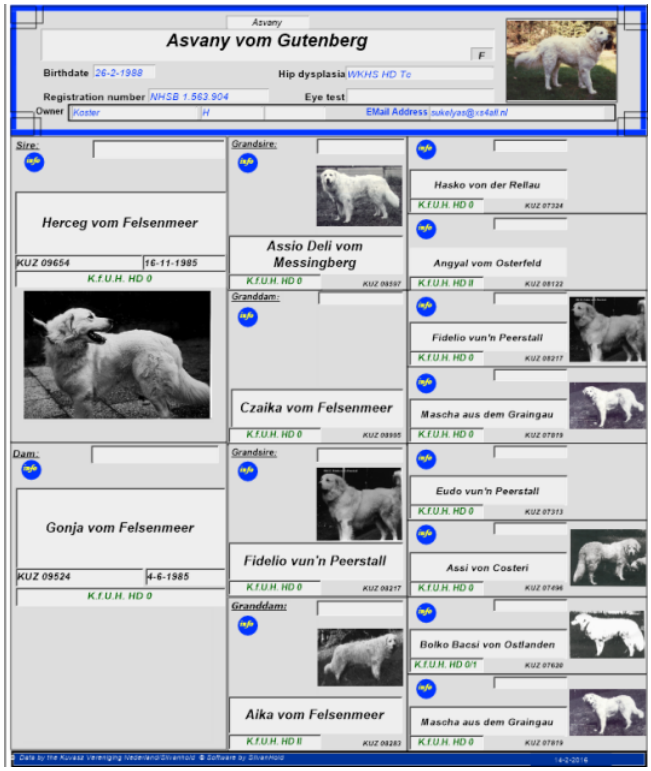
Temperament

The bite incidents were followed by the design of a temperament test, the so-called MAG-test. Everything was focused on preventing biting, and training a kuvasz for police work, as done in Hungary, would not be acceptable for the society easily. I know, an urban society is very different from a rural society. Just because of that, training a kuvasz to attack an assailant would not fit into our urban society.

A few kuvasz entered the MAG-test and showed a stable temperament and passed the test brilliantly. But as the test was a universal one (and not specifically designed for dogs like the kuvasz), the club never felt the urge to implement it.

[1] Song by Bob Dylan, 1964

Responsibility and liability

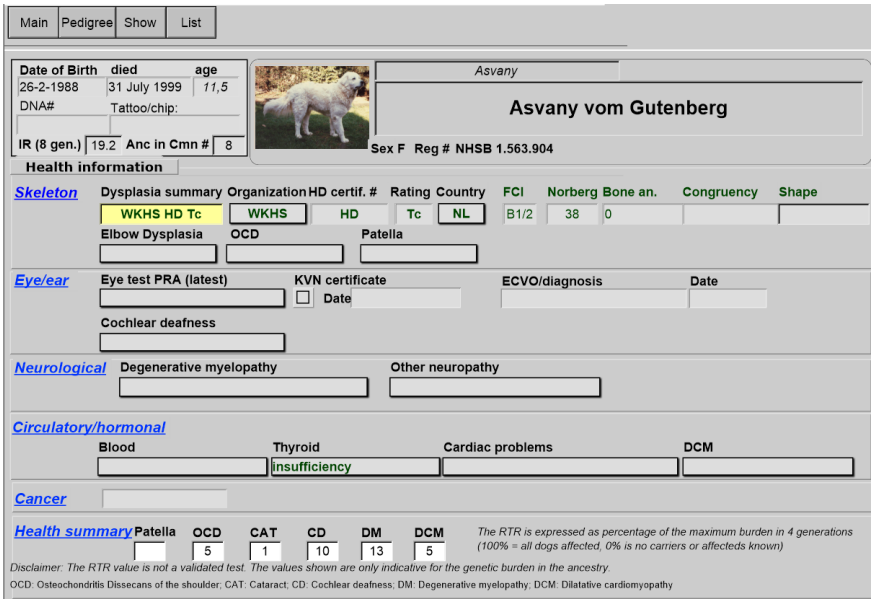


Of course a breeder always had the responsibility for the litters he/she would produce. But clubs tried to influence that by giving an advice. That could be suggestions for a stud or a positive or negative opinion. But again, if a breeder would not follow the advice, the club would not be able to take measures apart from expelling the breeder from the club. A draconic action, without any practical effects. With this in mind, the Breeding committee of the Dutch club changed its policy and didn't issue an advice anymore, but would provide information on proposed combinations. What this meant for the execution, will be discussed later.

A major change has been liability of breeders. When I bought my first kuvasz in 1981, (Elya), I had no idea of the problems that we had to face. Elya seems to be of impeccable origin: both parents were international champions. But when Elya started to have health problems, which in the end appeared to be OCD, we had no intention (nor juridical background) to sue the breeder. But when I asked at an AGM, why someone would like to breed with a dog with OCD, as actually did happen, I didn't get an answer.

Nowadays activists blame pure bred dogs whenever they can. The legislator created more protection for puppy buyers. In court, the judges rule in favour of the buyers more and more, especially when a breeder can't prove what he has done to prevent the problem for which he is in court. Recently, a case of degenerative myelopathy in a german shepherd caused a lot of fuzz, when the owners sought publicity and went on television with this case. Activists again used it as proof for their case against pure-bred dogs.

The Dutch Kennel Club felt the urge and even implemented a central regulation for each breed. In this regulation the basic health and well-being has been determined. Breed clubs could only add or strengthen rules, not change or alleviate the basics. A major improvement is that the Dutch Kennel Club will now punish breeders that infringe the breeding rules of the breed. The club only has a monitoring function in this and doesn't necessarily need to take action (but is of course



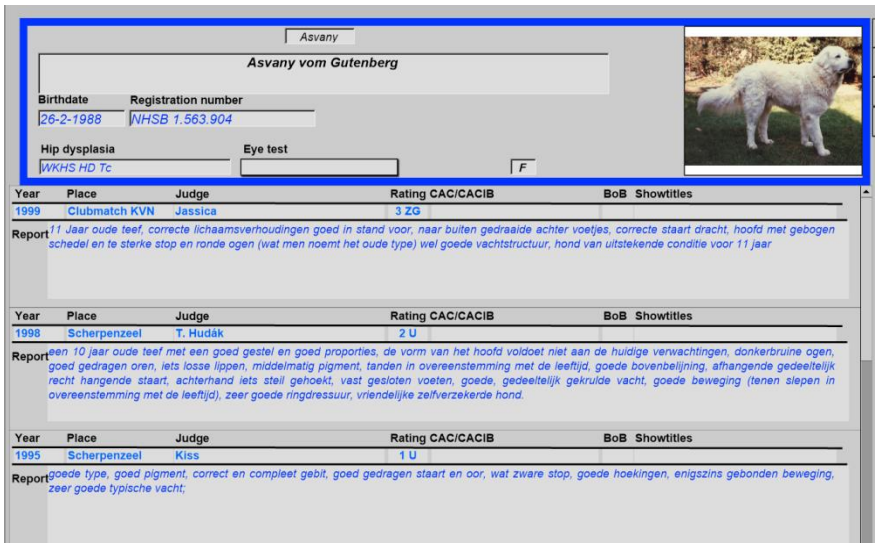
allowed to do so).

This means that a breeder has a lot more to prove to have some protection in case that something goes wrong in a litter. Generally a court always rules against a breeder, which leads to a minimum sentence of reimbursement of the costs made to reimbursement plus a fine.

Availability, diversity and globalization

As I already said, in the 70's and 80's, titles and show results were major selection criteria for the selection of a stud. The more titles, the more attractive. It lead to so-called matador studs. In the kuvasz, I know of 32 dogs that produced more than 100 puppies. Three even produced more than 200 puppies. Probably there are some more that we just don't know about, for example in the earlier days in Hungary, but also in the USA and Canada, it might have happened. The central breeding regulations of today prevent this by limiting the number of matings. The problem however is that the rule only affects the original country, e.g. The Netherlands, so a stud could be used in all European countries, only restricted by each individual club or country regulation. The club appeals to the owners of studs and breeders to act according to intention of the regulations, and not to the letter of it. Generally speaking this works satisfactorily.

This brings me to another major change: due to more and better means of transportation, the world has become smaller. Exporting and importing has increased enormously. Communication between breeders and owners opened new options. And last but not least, many Kennel Clubs have open databases. But not everything is being filed in those databases, so there is always a demand for information: "from whom am I buying", or "to whom am I selling?"


Asvany

Asvany vom Gutenberg

Birthdate: 26-2-1988 | Registration number: NHSB 1.563.904

Hip dysplasia: WKHS HD Tc | Eye test | F

Year	Place	Judge	Rating CAC/CACIB	BoB	Showtitles
1999	Clubmatch KVN	Jassica	3 ZG		

Report: 11 Jaar oude teef, correcte lichaamsverhoudingen goed in stand voor, naar buiten gedraaide achter voetjes, correcte staart dracht, hoofd met gebogen schedel en te sterke stop en ronde ogen (wat men noemt het oude type) wel goede vachtstructuur, hond van uitstekende conditie voor 11 jaar

Year	Place	Judge	Rating CAC/CACIB	BoB	Showtitles
1998	Scherpenzeel	T. Hudák	2 U		

Report: een 10 jaar oude teef met een goed gestel en goed proporties, de vorm van het hoofd voldoet niet aan de huidige verwachtingen, donkerbruine ogen, goed gedragen oren, iets losse lippen, middelmatig pigment, tanden in overeenstemming met de leeftijd, goede bovenbeijning, afhangende gedeeltelijk recht hangende staart, achterhand iets steil gehoekt, vast gesloten voeten, goede, gedeeltelijk gekruide vacht, goede beweging (tenen slepen in overeenstemming met de leeftijd), zeer goede ringdressuur, vriendelijke zelfverzekerde hond.

Year	Place	Judge	Rating CAC/CACIB	BoB	Showtitles
1995	Scherpenzeel	Kiss	1 U		

Report: goede type, goed pigment, correct en compleet gebit, goed gedragen staart en oor, wat zware stop, goede hoekingen, enigszins gebonden beweging, zeer goede typische vacht;

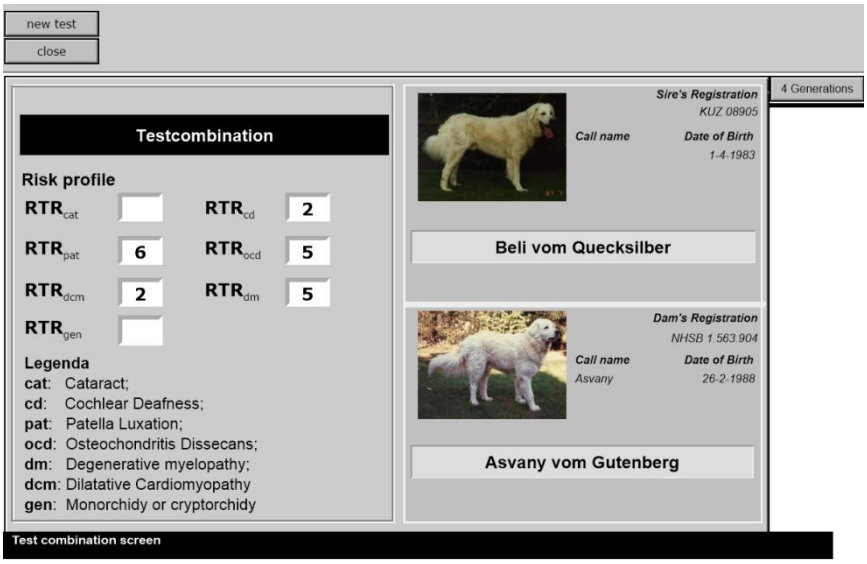
Inbreeding has been popular for years and years, but nowadays, people realize that inbreeding will reduce the gene pool, which will inevitably lead to problems. Whether these happen after a few years or a few decades, no one knows. But this new, open world should facilitate a reduction in inbreeding. But does it really works this way? I don't think so. Kennel clubs only file 3 generations of an imported dog. So what is further back in the ancestry remains officially undisclosed. So for accurate inbreeding information, one needs to combine all those data sources.

Tasks for and responsibilities of the club

First of all, I must emphasize that breeders have one common interest: the breed. To be able to sell puppies, a breed should not have a bad reputation concerning temperament nor health. So there is a common interest to share information. Unfortunately, not always breeders are on speaking terms. A way to get around that obstacle is to give the club a role in this, a role as Trusted Third Party (TTP).

The Dutch Kuvasz Club (KVN) started that already in the 80's and started to collect all kind of information and file it in its database. We collected health data, show data, titles, actually everything that reached us and was considered to be reliable (very important for the credibility). Whether the information would be in any way useful often appeared only years later.

The next step was to make the data accessible for the breeders. That too has been accomplished. And together with all breeders we decided which information would be accessible. Decision: all pedigree, show and health data. The only exceptions are data that are not reliable (hear-say) or have been submitted with the label “private” or “confidential”. This type of information is stored in a closed part of the database.



In the screenshots you can see which information is available for breeders. Most of it will be very clear, but one aspect needs a bit of explanation: the risk assessment. Based on the gathered information we can analyze the genetic burden expressed as a percentage in a combination. The result is a Relative Transmission Risk (RTR): the risk that bad genes have been or are being transmitted to later generations. An RTR of less than 12% is being considered a low risk. Breeders can use the assessment to estimate the risk for the puppies from the intended combination, without having to know the exact health status of 30 individuals. The RTR gives only an indication of risks.

The risks analyzed are:

- Cochlear deafness (CD)
- Cataract
- Patella luxation
- Osteochondritis dissecans (OCD)
- Degenerative myelopathy (DM)
- Dilatative cardiomyopathy (DCM)
- Monorchidy and cryptorchidy

Prcd-PRA is not in this list as there is a reliable DNA-test, which is mandatory. So we don’t need to work with estimates, we know the exact status of each dog which is entered into a breeding program.

Another responsibility apart from collecting data is analyzing data. I will mention two examples: PRA and Degenerative myelopathy.

Prcd-PRA

When the first cases of PRA were found and published, the pattern was rather alarming: apparently unrelated cases in Sweden and Germany. But looking further back there were common ancestors, and what was more alarming: it appeared that we already recorded several cases of unexplained blindness which could again be linked to the new cases via ancestors. The picture was that we had a mutation in the breed with a wide distribution. There was also a case detected in the USA (an imported dog), and this case was analyzed by Optigen. They found the responsible mutation and could offer a DNA-test. Although there are more forms of PRA, it seems that the prcd-PRA is still the

only mutation in our breed. Implementing the test would therefore warrant a disease free offspring. At some moment there was a panic when a dog developed blindness , while being a carrier of the prcd-mutation. However this case had a sudden onset and progressed in a few weeks into complete blindness. This resembles a condition called SORD (Sudden Onset Retinal Dysplasia), and in no way looked as a classic progression of PRA, which takes years.

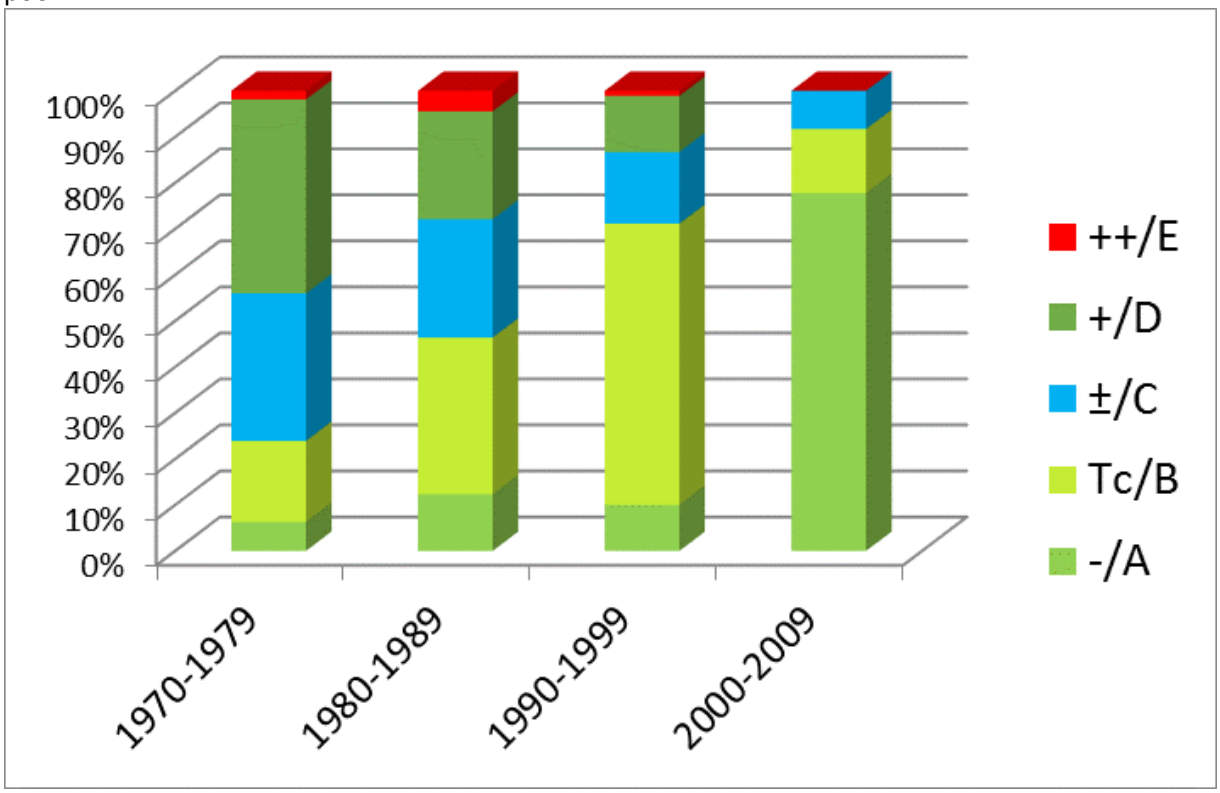
A clinical eye test (ECVO-test) might be useful, but till now no other classic PRA-case has been detected in dogs free of the prcd-mutation or carriers of it.

Degenerative myelopathy

Degenerative myelopathy (DM) only popped up quite recently, but almost simultaneously a television program paid attention to this condition. Again very negative publicity for pure-bred dogs. In our kuvasz population, a few dogs were diagnosed by a DNA-test to be affected, and when another DNA-positive dog popped up, we started to research our data. It appeared that there could have been quite a few sufferers based on the clinical symptoms, descriptions and age, but of course, we couldn't get definitive diagnoses for these dogs anymore.
So we advised our breeders to test for the SOD-mutation but did not implement breeding restrictions. We just will evaluate in a few years the test results but so far the problem seems to be less widespread as we feared.

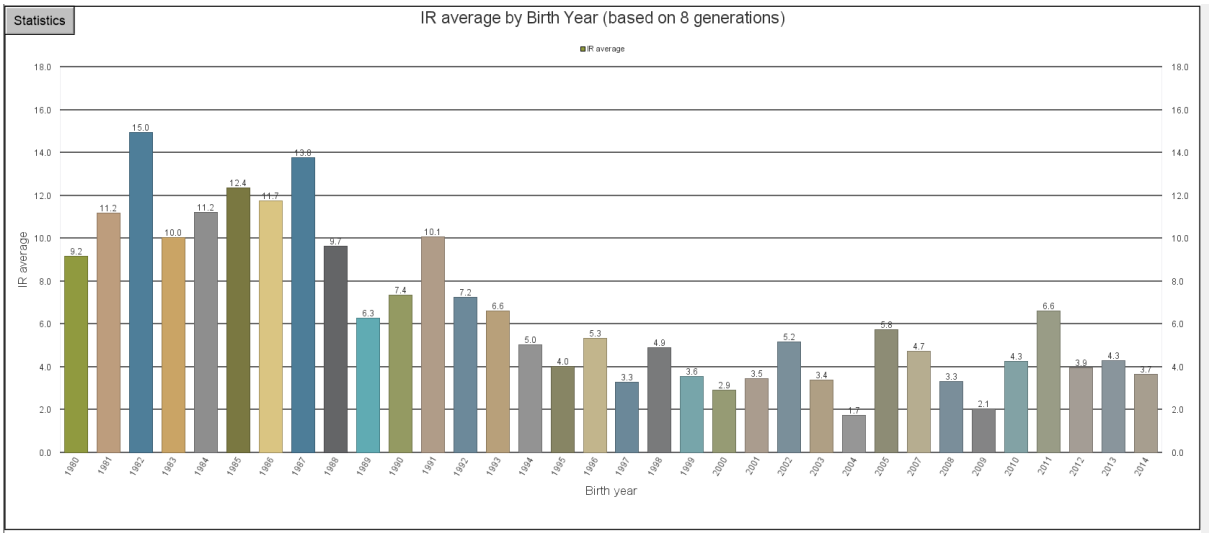
Results

Certainly the DM-case raised very negative reactions. Opponents stated that tests and subsequently breeding restrictions lead to a shrinking of the gene pool. Theoretically they might be right. But is that the situation in practice? Let's have a look at the long-term effects of HD-rules. It is the only breeding restriction that has been implemented long enough to have a profound effect on the gene pool.



What you can see in the graph is that during four decades the HD-situation improved considerably. But what are the effects on the gene pool? The inbreeding ratio is considered to be a measurement

for the genetic diversity. An average inbreeding ratio of 10% or higher is considered to be a risk factor for the breed. Now look at the graph of the inbreeding ratio. It starts in 1980 (the KVN was founded in 1981, and received provisional recognition in 1988). Then after 1990, the IR slowly drops and is now around 5% or even lower.



I see similar patterns for dogs in the kuvasz populations within the KfUH, the KVD and in Sweden. So based on this information, the fear for an increase of the IR as a result of breeding restrictions is not necessary at this moment. However, monitoring of the effect on the IR of a (new) breeding restriction is still necessary.

Conclusions

- Globalization is an unstoppable process, but needs to be supported by international data collection.
- Exchange of data, ancestry and health, is in the interest of everybody.
- An international oriented database with as much information as possible is a blessing, not a threat.
- DNA-testing should be implemented if possible, but monitoring of the impact on the average IR's in the population(s) is mandatory to prevent unnecessary and undesirable shrinking of the gene pool.
- In many countries, the average IR is so low, that introducing of unregistered kuvaszok is not indicated.
- If introducing of unregistered kuvaszok is considered, one should be sure that
    a) The dog(s) is (are) different as identified by a DNA profile; re-introducing of already existent profiles is useless;
    b) The dog(s) is (are) tested for the relevant conditions, if possible by a DNA-test; introducing of, for example, carriers of prcd-PRA would be disastrous for the population and counteract the intentions.

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