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Proposal for control of identity at international races through fast DNA-determination.

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The IFAHR needs a method to prevent fraud based on the identity of horses at races.. Using DNA analysis, it will be possible to identify all animals present at international races, within short delay.

I. Advantages of DNA-identification over other methods:

- 1) A genetic DNA-profile can be established at any age of a horse, and will not change throughout the life of an individual horse.
- 2) The DNA-profile of each horse is far more unique than its blood-type, ensuring that the probability for two horses to have identical DNA-profile is far smaller than identical hemo-types.
- 3) Internationally agreed upon set of genetic markers are used allowing the exchange of data by electronic systems.
- 4) Another advantage of DNA-determination is that it can be done from a wide range of material, such as blood and hair roots, making collection on any site possible by unspecialised persons.
- 5) Material used for DNA-determination can be stored for long time , allowing control of any determination at a later stage

II. The two steps of identification are :

A. Establishing an DNA-databank of “reference” –profiles:

usually by DNA–determination at birth (including parentage control),

Utmost importance of correct initial DNA-profile, because this will be “reference” for future comparison when horses are controlled at races. This “**reference**”-**determination** either at birth, at the moment of registration, or at the time horse is selected for (international) races.

Usually

Several precautions can be taken to generate “reference” DNA-profiles without errors,

- a) Sampling of one horse by a minimum of **two different persons**.
- b) **Parentage control**. Verification of parentage will enable the validation of DNA-profiles. Using the current set of genetic markers, 99.5 % of incorrect samples will be detected.
- c) A **combination** of the above two strategies will result in a most advantageous and safe situation.

Further, this DNA bank enables the identification of lost or stolen horses.

Last but not least, this DNA bank can be used in the future whenever we will be able to detect a (new) genetic (dis-)order, to check the population for it .

B. Control of identity of horses at the races (can be repeated at every main race):

- a) Technically it is possible to establish DNA-profiles within 24 hours.
- b) Samples could be collected (less traumatic than blood-sampling) before the races avoiding eliminations later-on.
- c) Therefore the time elapsed between sample collection and reporting result of analysis should be carefully monitored , necessitating the knowledge of the “reference” DNA-profile of all runners. (information to be collected from the internat. Recognised lab.s)
- d) Cross-check after the races is also possible with fast answer

ATTENTION: No “breed specific” markers

Currently, no genetic markers are available. In the past, one specific protein was believed to distinguish between pure bred Arab Horses and horses crossed with e.g. Thoroughbreds. This specific marker however, is generally present in Arab Horses of different lineage. There is no evidence that this marker was caused by cross breeding, this marker might as well be due to a mutation in the past.

III. Technical realisation:

- a) Sample collection (pulling of hair roots) at race-track , more than 24 hours in advance, in legally correct context; (+ collection of duplicate samples for a second DNA analysis)
- b) Proper shipment of samples to dr. Van Haeringen Laboratorium (VHL) in Holland min. time, no lost samples,
- c) DNA analysis at VHL (24 hours), announcement ahead
- d) Cross-check with “reference”-DNA-profile of the concerned horse + independent interpretation of the two duplicate samples
- e) Report of results (confidentiality: method of report and to designated person)

IV. Administrative aspects

- An international regulation making “reference”- DNA- analysis compulsory for entering a horse to an international race
- Submission forms for the determination accompanying the samples .

V. Financial aspects

- 1) Determination of “reference”-DNA-profile: **50 €** (preferentially two samples !)
- 2) Parentage testing: Parents with known DNA-profile: **50 €**
Parents to be DNA-profiled : + **50 €** per parent to be tested
- 3) Control of identity within 24 hours (overnight service):
Less than 5 horses: **1000,00 €** for them all
Between 5 and 10 horses: **200,00 €** each
More than 10 horses : **150,00 €** each.
- 4) Establishment of DNA-bank: storage of samples in 2 different locations to avoid loss by external factors for 15 years, unlimited number of horses:
10,00 €
- 5) Consultancy by VHL-staff members : daily allowance of **250 € / day** + travelling, accommodation, etc. at actual cost price.

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