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Collaboration with Benoit Hédan

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HSIMS

Histiocytic Sarcoma Index Mate Selection

Tool for breeders to obtain the statistical distribution of the A, B or C indexes in the litter for one specific mating.

SH test reminder

- The research selected **9 markers** linked to to the risk to develop and give the histiocytic sarcoma
- Validation of the interest of these markers done on 1081 BMDs, most of them were French

SH test reminder

- 1 marker = 3 possibilities

11

12

22

SH test reminder

- Set up of a statistical index based on 9 markers

11 11 11 11 11 11 11 11 11

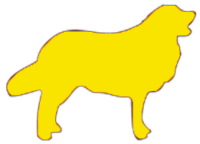
12 12 12 12 12 12 12 12 12

22 22 22 22 22 22 22 22 22

SH test reminder

- Set up of a **statistical index** based on 9 markers : 3 possible results (A,B or C)

11 11 11 11 11 11 11 11 11 → Index **A**



12 12 12 12 12 12 12 12 12 → Index **B**

22 22 22 22 22 22 22 22 22 → Index **C**

Selection tool for the breeders to decrease the histiocytic sarcoma frequency in the BMD breed.

What is the proportion of the different indexes in a litter according to the mating?

Study of litters

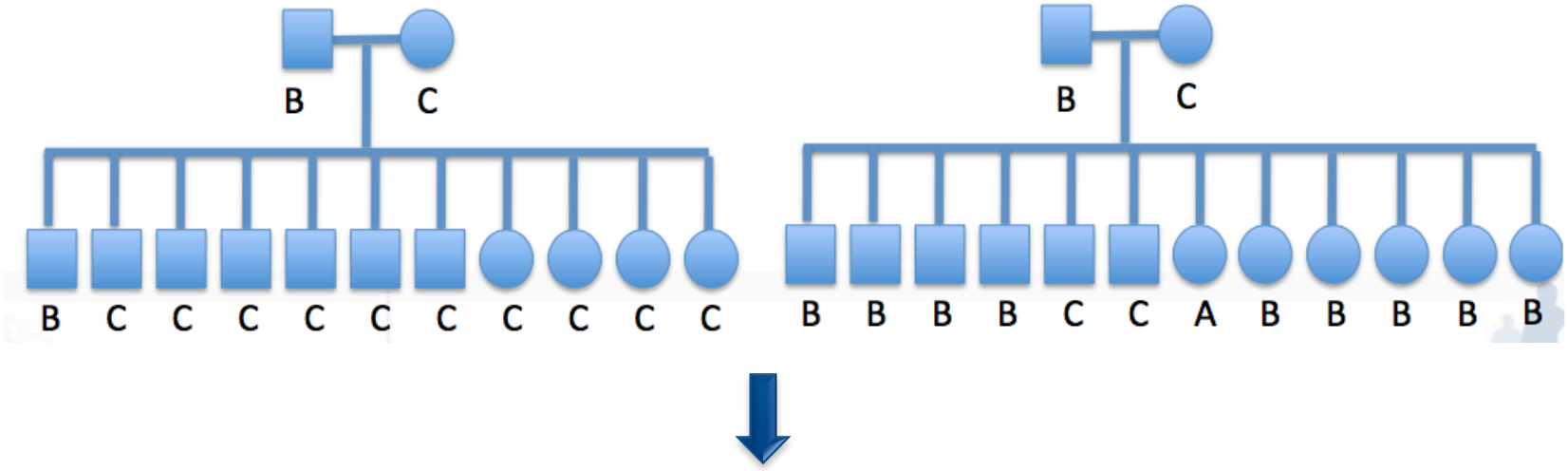
- In collaboration with the French Club AFBS, the CNRS team and Antagene, 112 puppies from 18 litters were tested.

- Results:

- Matings with at least one C parent have more puppies with C index.
- Matings with at least one A parent have more puppies with A index.
- Exceptionally, A puppies may occur with a C x C mating
- Exceptionally C puppies may occur with a A x A mating.

Study of litters

- 2 matings with identical indexes on parents may produce litters with a different distribution of indexes.



The compatibility varies between the sire/dam dogs.

Is it possible to predict the compatibility between a sire and a dam?

Is it possible to predict the compatibility between a sire and a dam?

Is it possible to predict the index distribution in a litter according to the mating?

HSIMS : how does it work?

- Histiocytic Sarcoma Index Mate Selection

= Tool for mating selection according to the SH index of the parents.

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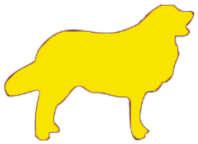

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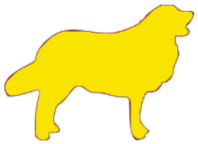

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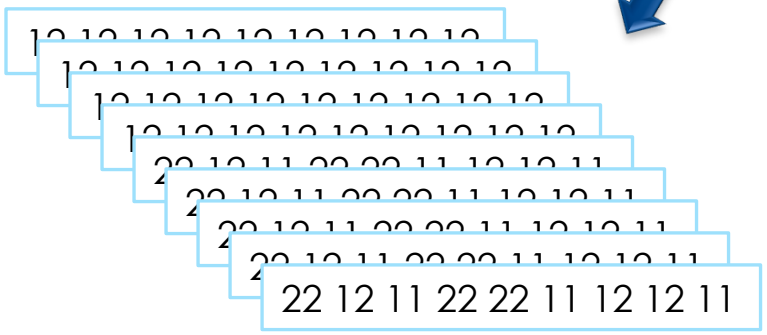

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Up to **20 000** possibilities
for 1 mating

HSIMS : how does it work?

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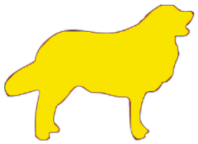

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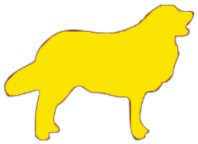

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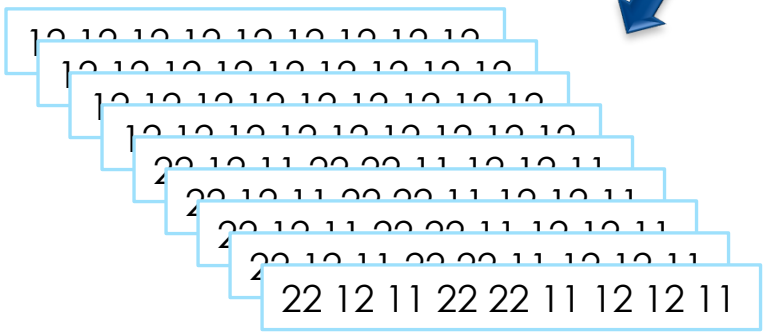

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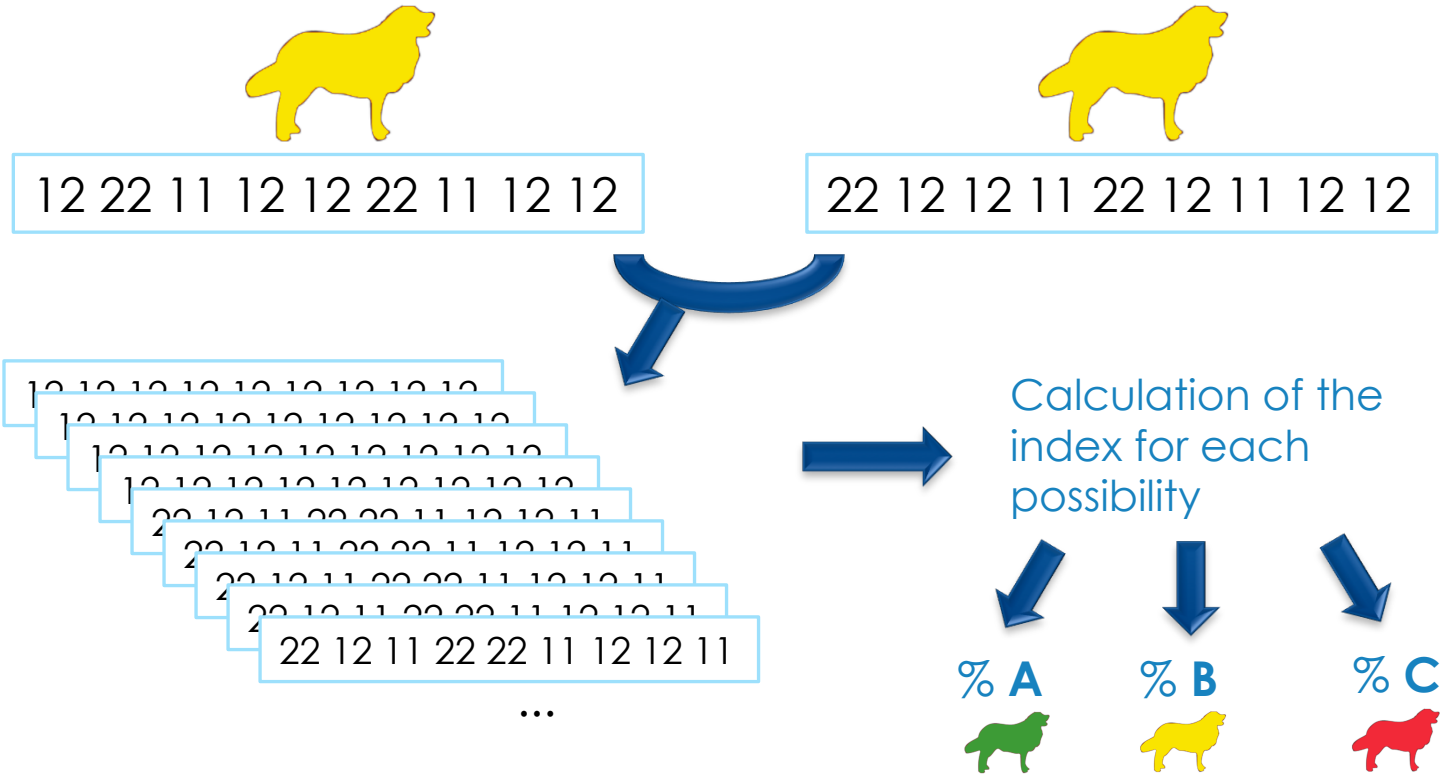
Calculation of the index for each possibility

HSIMS : how does it work?

- Histiocytic Sarcoma Index Mate Selection

= Tool for mating selection according to the SH index of the parents



HSIMS : how does it work?

- Histiocytic Sarcoma Index Mate Selection

= Tool for mating selection according to the SH index of the parents

Selection tool allowing to **statistically** calculate on the progenies the probabilities to obtain A, B or C index **for a given mating**.

The result of the HSIMS tool is strictly specific for each considered couple.

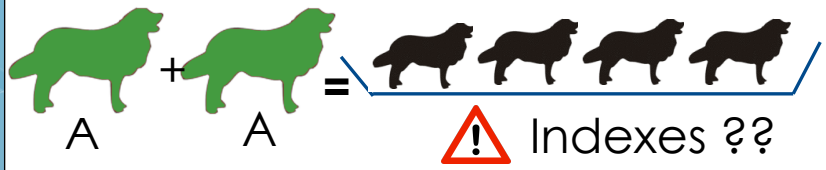
HSIMS : what for?

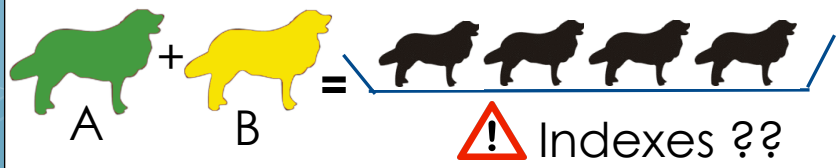
- To select matings which would produce the best indexes statistically.
- To choose the best partner for your dog
- To find the best mating for your BMD who has a C index.
- To avoid « at risk » matings

HSIMS : what for?

- To select matings which would produce the best indexes statistically.

Matings selected without HSIMS





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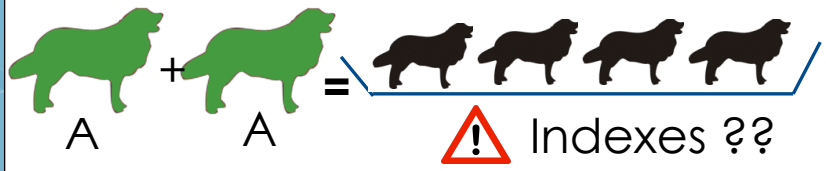
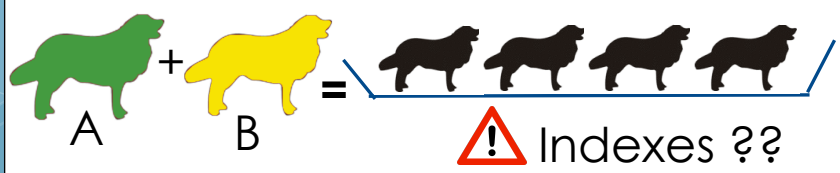
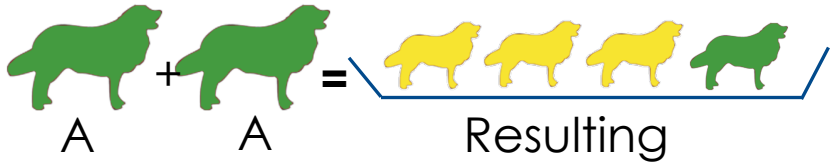
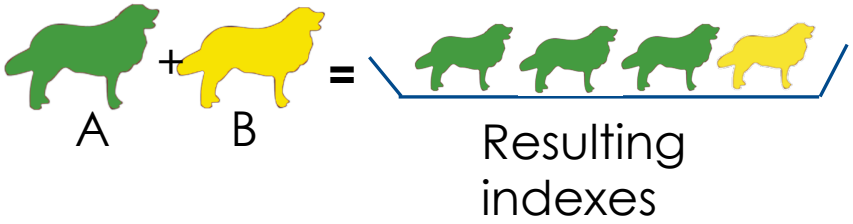




Matings selected with HSIMS





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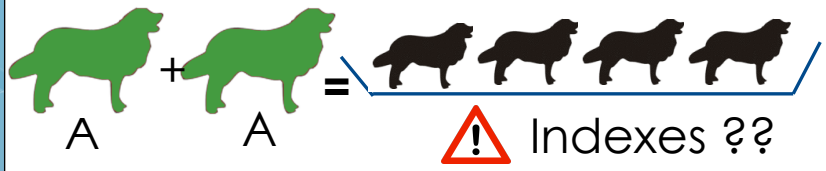

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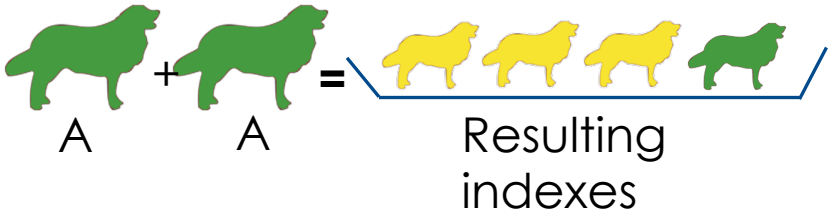
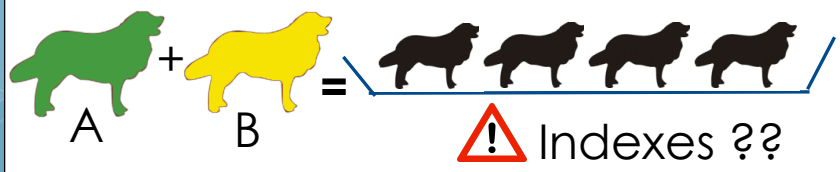
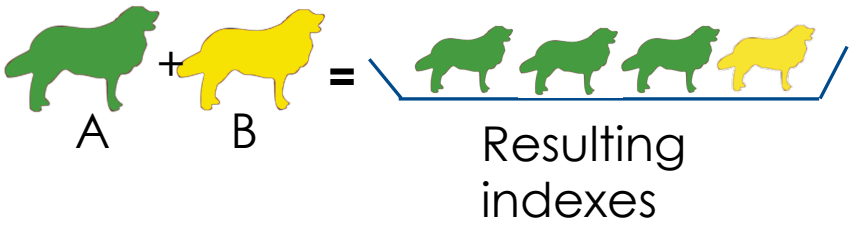


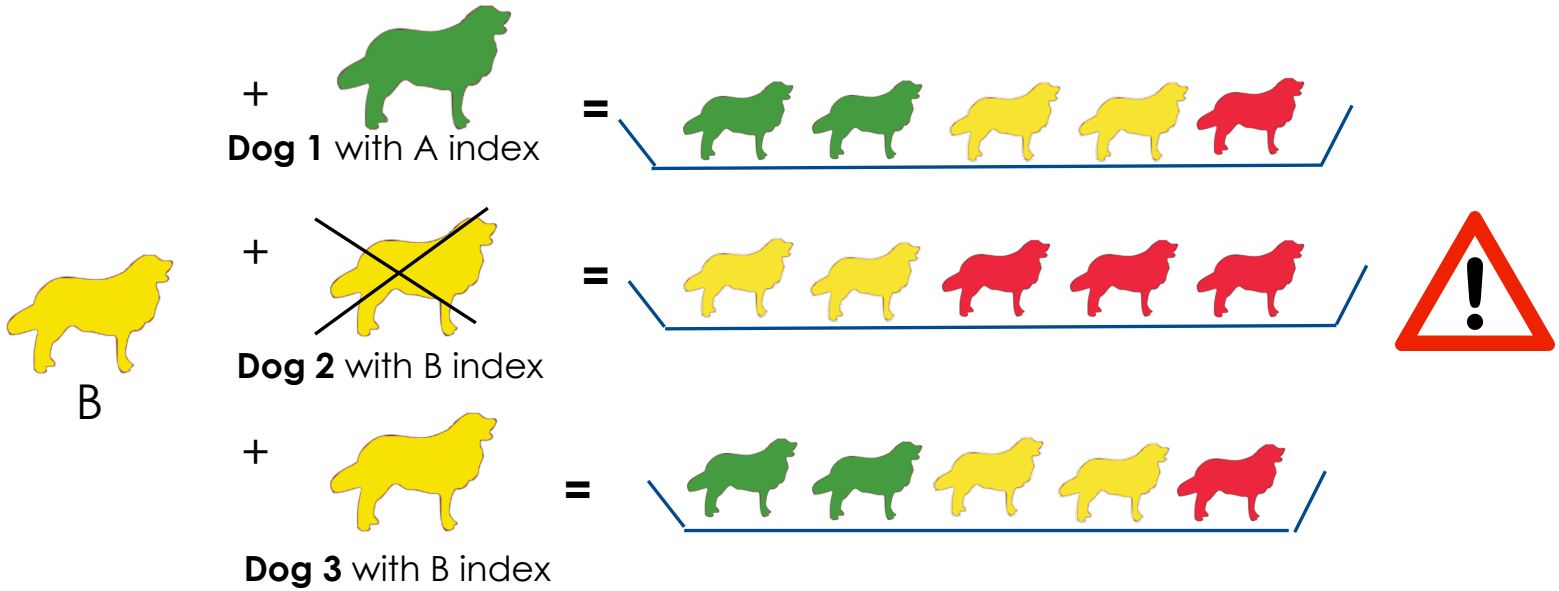




The second mating seems better

HSIMS : what for?

- To choose the best partner for your dog

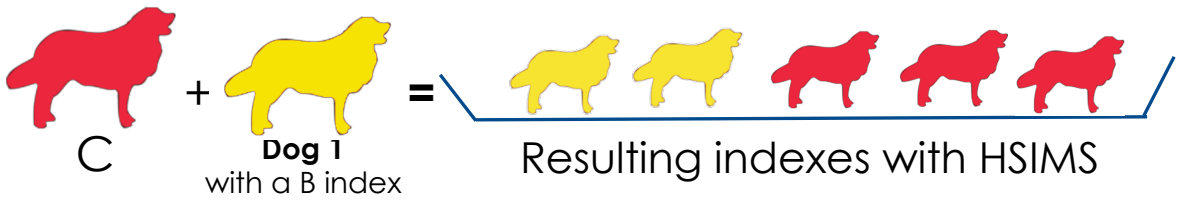


The second choice must be avoid
The first or third choice is up to the breeder, his selection work regarding other criteria such as behaviour, health, morphology.

HSIMS : what for?

- To find the best mating for your BMD who has a C index.

Mating with dog 1 which obtained a B index after a HS test

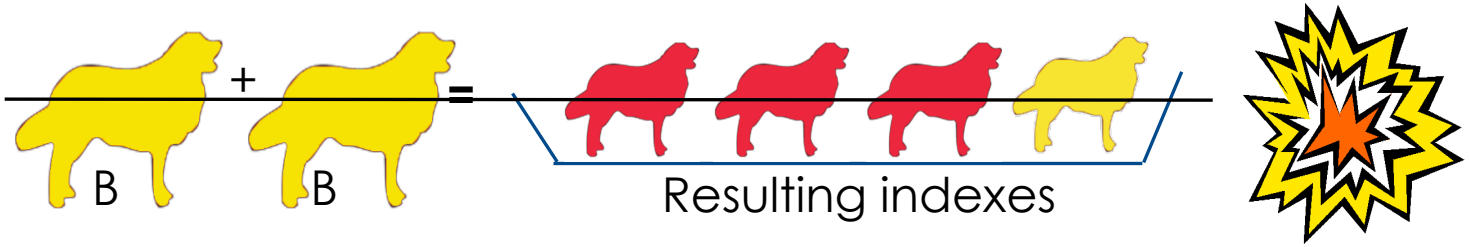


Mating with dog 2 which obtained a B index after a HS test

The mating with the second dog should be favoured

HSIMS : what for?

- To avoid « at risk » matings



The breeder should favor another mating.

HSIMS : in practice

- To use HSIMS, **both male and female** must have been **SH tested**.
- **International database** with **direct access** for worldwide BMDs breeders
- **Confidentiality** on the index of the SH test
- **Individual** and **reversible authorisation** for each dog
- **Result property**: restricted use : at least one dog of the tested mating has to be owned by the user.

HSIMS : how does it cost?

- **Important cost** for all the parts to do research and to build the **SH test**.
- **Development** of a **web interface** and a **database** HSMIS compatible with the user expectations.
- Looking for **financing** to achieve the HSIMS computing development and to offer this tool **for free**, as everybody wishes.

HSIMS : What was done?

- **Index calculation development** : creation of a mathematical formula in order to define all the indexes resulting of a mating between two dogs tested for HS

HSIMS : What was done?

- **Index calculation development.**
- **Validation of the formula** : formula validity checking upon real data.

HSIMS : What was done?

- **Index calculation development.**
- **Validation of the formula.**
- **Website specification :** descriptions of the necessary units in order to fill out all the functioning conditions for the HS tested Bernese Mountain Dogs breeders and owners.

HSIMS : What is left to be done?

- **Website development.**

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- **Website development.**

In order to guarantee a free use of HSIMS by the breeders, we ask all the Bernese Mountain Dog clubs around the world to support financially the website developing costs and so, allowing the availability of this tool via Internet.

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