NORMANDE PROOF RELEASE

Evolution International's Normande : the dairy cow that provides to farmers the highest added value of milk and meat, autonomy, and secured incomes.

TOP NEWS from December proof run:


Daughter of JIBRALTAR

- *New success of Evolution genetics* :
  9 Evolution bulls in **TOP 10** !!

- *TOP ISU* : ORFEVRE (164), NEWYORK (164), JEONIX (163) NAVIDAD (163) and OSORNO (162)
- *TOP Proven bulls* : GAME OVER (149), ISTAMBULL (149) HUMUSS ISY (146), IGANTO (146) and JIBRALTAR (144)
- *TOP bulls with Easy calving (>90)*

92 for NEWYORK (164) and OSORNO (162), 90 for MONFORT (161) and 92 MANCHESTER (159)

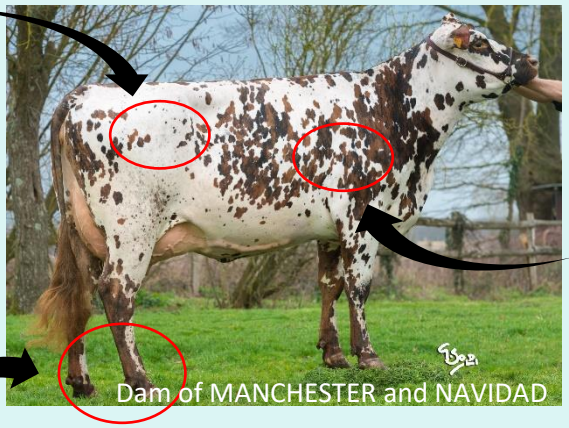
4 NEW PROOFS IN NORMANDE BREED

1) GenoSanté : Hoof health
2) Gestation Length (GL)
3) Feed Efficiency (FE)
4) Descendants homogeneity (HD+)

You have a book with the description of all new innovations at the end of the proof release !

Top bull in new proofs : **MANCHESTER** (Available in conv semen and sexed on order)

Gestation Length : **- 7 days**


Dam of MANCHESTER and NAVIDAD

Feed Efficiency : **+2.1**

HOOF HEALTH

Resistance to Infectious Lesions (RLI) : **+0.5**

Resistance to Non-Infectious Lesions (RLNI) : **+0.0**

NAVIDAD is a **HD+ bull** on the milk production: his offspring will be 15 to 30 % more homogeneous in milk production than the average.

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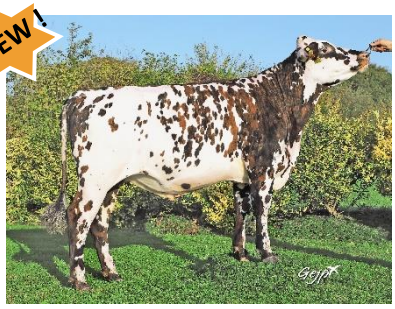
OXYMORE : The best for milk and contents yields (144, BB, A2A2)

OXYMORE is a bull with amazing levels in milk (+949 kg), fat (+0.23%) and protein (+0.23%) !!
He also brings excellent type (+1,1) with moderate size and strong udder (+1.3). His feed efficiency is very good (+1.9). Calving ease at 88, have to be used on cows only.
He is HD+ for protein and udder !



JEDUSOR : New proven bull with high milk production (113, BB, A2A2)

JEDUSOR is a proven dairy type bull with milk (+682 kg) and protein (+0.1%). He has a very good fertility of semen (F+) and also fertile daughters (+0.5). Daughters have very good Feet and Legs (+0.6) and strong, high and healthy udders !
Calvings are very easy with JEDUSOR (93), he can be used on heifers.

ORNEUS : An authentic bull in sexed and conv semen (154, AB, A2A2)

ORNEUS is a bull who gathers all Normande original qualities : milk (+699 kg), fat (+0.23%), proteins (+0.1%), reproduction (+1), feet and legs (+0.7) and feed efficiency (+1.8). The type is also authentic : moderate size (+0.1) with wide (+0.5) and deep body (+0.7). Udders will be well attached (+1.1) and balanced (+1). ORNEUS is HD+ for the fertility (+1).
Easy calving at 89, can be used on cows or heifers with sexed.

OLYMPIC : A high milk producer (145, AB, A2A2)

OLYMPIC is a bull with high milk production (+961 kg) with good health (+0.5), reproduction (+0.4) and health udder (+0.5). In type, daughters will be small (-0.2) and deep (+0.8) with excellent udder (+0.8) and feet and legs (+0.5). Veals will have good beef added value (+0.6).
Easy calving at 90, he can be used on cows and heifers.

JITAN : The grazing bull gets his first daughters ! (155, BB, A1A2)

JITAN is a perfect grazing type bull ! His daughters begin to calve and come in milk. They have a high milk production (+768 kg) with high level of fat (+0.25%) and protein (+0.07%). They have an exceptional health (+0.7) and health udder (1.3). Daughters have functional feet and legs (0.9), strong attached udders(+1), a good feed efficiency (+2.2). Calving ease at 90, he can be used on heifers and cows. JITAN is HD+ in protein.

OTANK : Dairy bull from a strong family (150, BB, A2A2)

OTANK is coming from INFLUENCE family (NEOPPS grand dam), strong family in France. He brings a lot of milk (+1160 kg) with fat (+0.1%) and interesting beef value (+0.8). His type combines moderate size (+0.6) and very wide (+0.7) and deep (+1.5) body. Udders will be strongly attached (+1.2) and well balanced (+1.3). Calving ease at 88, he can be used on cows only.

EVOLUTION International

EVOLUTION
International

GENETIC EFFICIENCY

To improve your herd's performance

4 INNOVATIONS

2020

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EVOLUTION EXCLUSIVITY!

4 INNOVATIONS

SUPPORTING GENETIC EFFICIENCY

#1 HOOF HEALTH NEW

#2 GESTATION LENGTH (GL)

#3 HOMOGENEITY OF DESCENDANTS (HD+)

#4 FEED EFFICIENCY (FE)

EVOLUTION GENETICS EFFICIENCY TO IMPROVE YOUR HERD'S PERFORMANCE ...

Because each herd is specific, EVOLUTION proposes you a genetic offer adapted to your objectives which respects this diversity, while combining excellence and reliability. You thus benefit from the best EVOLUTION sires to enhance your breeding system, and obtain the optimum from your animals!

For that, we develop a genetic based on three performance pillars:

DIVERSITY **EXCELLENCE** **RELIABILITY**

DECEMBER 2019 : EVOLUTION GENETICS EFFICIENCY GETS STRONGER WITH THE ARRIVAL OF 4 INNOVATIONS :

From the EVOLUTION teams and funded by the cooperative, these 4 innovations are part of a movement towards precision genetics : a genetic that improves the efficiency of your breeding, by an ever more precise adaptation to your system.

The coordinated publication of these 4 innovations will allow everyone to choose from the solutions that best suit them to improve their own system efficiency!

CHOOSE!

4 PRODUCT SHEETS TO UNDERSTAND AND USE THESE INNOVATIONS IN YOUR HERD

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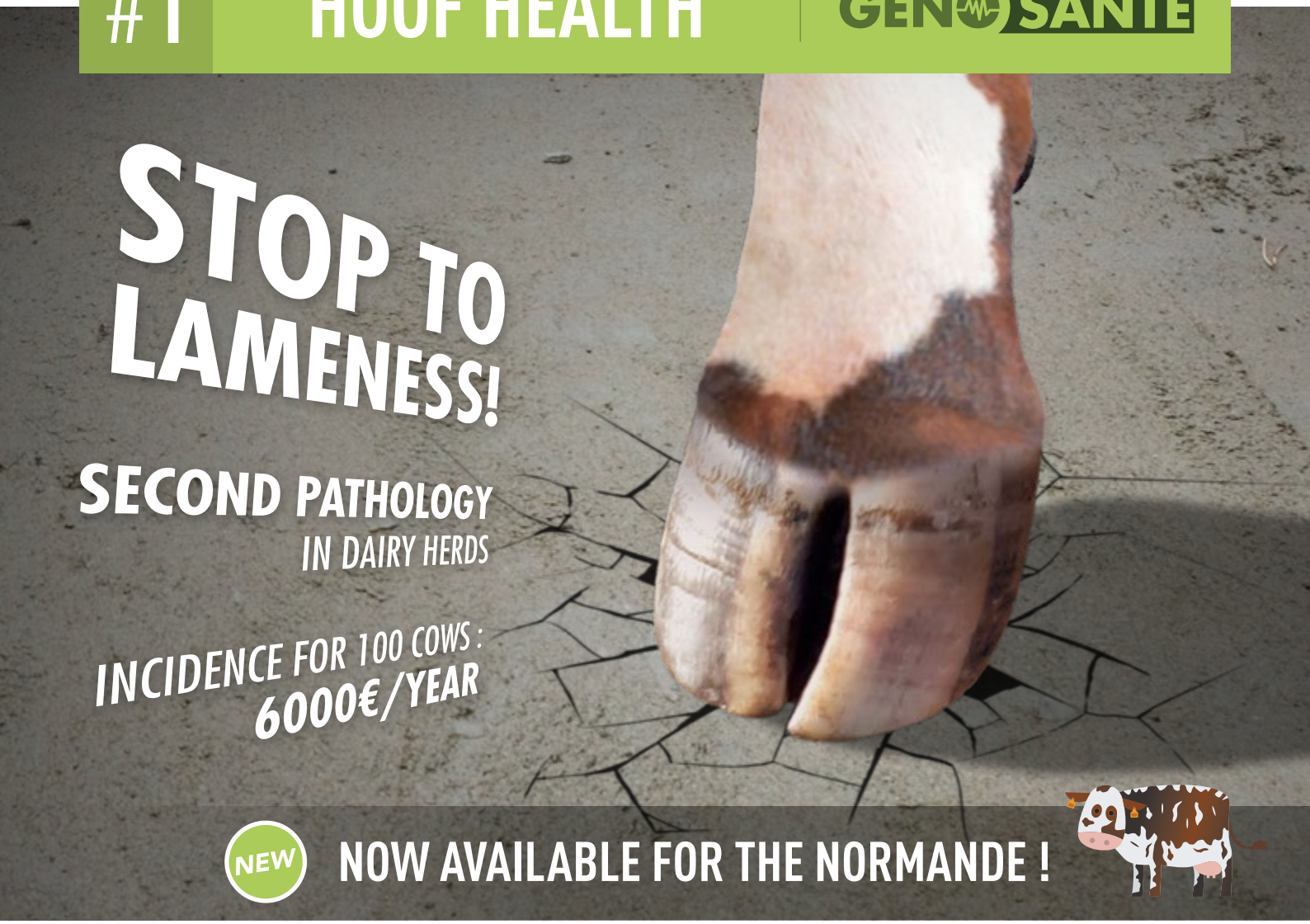
EVOLUTION EXCLUSIVITY!

4 INNOVATIONS SUPPORTING GENETIC EFFICIENCY

#1 HOOF HEALTH | GÉNOSANTÉ



STOP TO LAMENESS!

SECOND PATHOLOGY IN DAIRY HERDS

INCIDENCE FOR 100 COWS : **6000€/YEAR**

NEW **NOW AVAILABLE FOR THE NORMANDE !**

RLI
RESISTANCE TO INFECTIOUS LESIONS

2 SCIENTIFIC INDICATORS TO MANAGE HOOF HEALTH

RLNI
RESISTANCE TO NON-INFECTIOUS LESIONS

WE GIVE YOU TOOLS TO MOVE FORWARD RIGHT NOW :

Our bulls are evaluated

Genimprove *Your females are evaluated by EVOLUTION genotyping*

Developed by GENOSANTE collective and its partners

PRODUCT SHEET: UNDERSTAND AND USE THIS INNOVATION IN YOUR HERD

EVOLUTION International

#1 HOOF HEALTH

GÉNOSANTÉ

HERDS CONTEXT AND CHALLENGES

HOOF HEALTH ISSUES IN NORMANDE BREED

Lameness is the second pathology of dairy cows after clinical mastitis. 11% of cows have clinical lameness and 2 to 3 time more subclinical lameness.

Direct Consequences:

- Limits movements (fewer robot passages), falling risks
- Ingestion, rumination and therefore production decrease (-300 to 500kg of milk) and effects on feed disorder (ketosis, acidosis)
- Degraded cyclicity and heat expression with 35% more failures at AI
- Weight and body condition losses *(Huxley, 2013)*
- Culling are 8.4 times higher in cows with clinical lameness *(Sprecher et al., 1997)*
- Animal welfare (stress and immunity decrease – metritis, mastitis...)

Economic impact: 265 € per cow with clinical lameness and 130€ per cow with subclinical lameness.

I.e 5,830€ per year for an average herd of 100 dairy cows

PRINCIPLE OF EVOLUTION INNOVATION

WHAT IS THE NORMAND HOOF HEALTH?

Génosanté hoof health indicator Genosanté is the most robust information for the Normande breed.

- **The largest reference population:** 38 299 females taken into account, of which 18 152 trimmed since 2014, 5496 genotyped and trimmed females and 406 bulls with results on progeny
- **The same scientific methodology as all official proofs:** : INRA, Idele, Allice
  - A continuous enrichment of new cows trimmed in the reference population
  - Bulls and females with genomic indicators : expression of trends by range: [-1.0 ;-0.5 ;0 ;+0.5 ;+1.0]
  - Proven bulls with trimmed daugthers : The proof is more accurate with higher reliability
- **2 indicators for a more reliable selection effect**
  - RLI : (Resistance to Infectious Lesions) : Dermatitis and Interdigital Hyperplasia synthesis
  - RLNI : (Resistance to Non-Infectious Lesions) : White Line, Sole Ulcer and Sole Hemorrhage Circumscribed synthesis

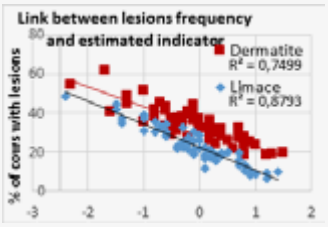
Examples of the genetic proofs effect on bulls with more than 50 daughters:

RLI : Interdigital Hyperplasia :

- +1 bull : 60% fewer daughters with Interdigital Hyperplasia than the average (10% vs 24%)
- -1 bull : 60% more daughters with Interdigital Hyperplasia (38% vs 24%)

RLI : Dermatitis :

- +1 bull : 25% fewer daughters with dermatitis (25% vs 35%)
- -1 bull : 25% more daughters with dermatitis (45% vs 35%)



BENEFITS FOR THE BREEDER

WHICH BENEFITS FOR THE BREEDERS ? 1ST GENERATION : 600€ GAIN/ 100 DAIRY COWS /YEAR

1- For females: get 2 indicators to limit the incidence of lameness

2- For bulls : identify the most favourable (especially among the proven ones/more precise)

Example for a 100 dairy cows herd of which 30 females have lesions, including 10 clinical and 20 sub-clinical lameness:

- Targeted mating for sensitive females (-1) with improving bulls (+1)
- 7% reduction in the lesions expression, ie an economic gain of 600€/ year

Bibliographical references: ***Boiterie clinique : Pertes de lait >350kg (50-800kg)*** *(Green et al 2002, UMT Boiteries 2011) ; (Holzhauer, 2003)*

EVOLUTION EXCLUSIVITY!

4 INNOVATIONS SUPPORTING GENETIC EFFICIENCY

#2 GESTATION LENGTH (GL)

A TOOL TO IMPROVE YOUR CALVING-CALVING INTERVAL

+ production - unproductive days	+ reproduction control, ideal for grouped calvings	+ comfort	From 800 to 1500€ stake for 100 cows

WE GIVE YOU TOOLS TO MOVE FORWARD RIGHT NOW :

Our bulls are evaluated with GL proof

Genimprove

Your females are evaluated by the EVOLUTION genotyping

PRODUCT SHEET: UNDERSTAND AND USE THIS INNOVATION IN YOUR HERD

EVOLUTION International

#2 GESTATION LENGTH (GL)

HERDS CONTEXT AND CHALLENGES

ISSUES OF GESTATION LENGTH IN HERDS

The gestation length plays a role in the productive life of dairy cows on 3 aspects:

- The productive days rate : a dry cow consumes 1.3€ per day and 1 housing place.
- Reproduction with calving-calving interval : 1 additional day of CCI (calving-calving interval) costs 2€/ dairy cow / day.
- Calving control and comfort: a difficult calving costs 300€.

A strategic challenge for seasonal systems

The impact of gestation length is particularly pronounced in seasoned calving systems. Indeed, non-pregnant cows for the targeted period are delayed or culled. It's between 10 and 15 % of incurred culling.

PRINCIPLE OF EVOLUTION INNOVATION

WHAT IS THE GESTATION LENGTH PROOF?

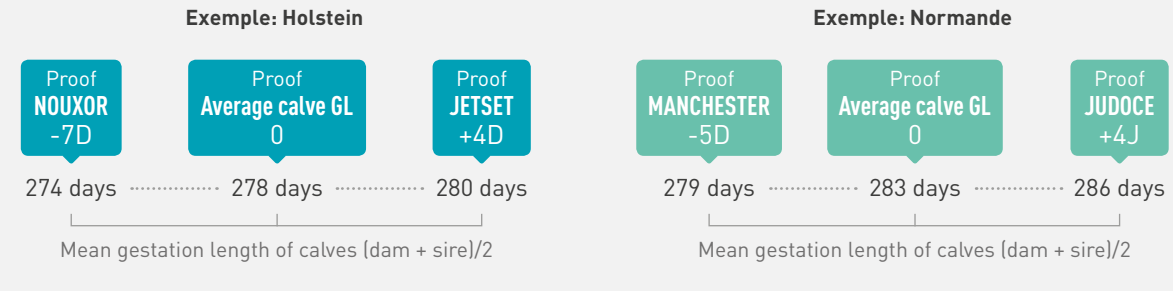
This proof is calculated by EVOLUTION's Research & Development team, following the G-BLUP international indexing methodology, from 476 369 genotyped individuals (401 685 Holstein et 74 684 Normande) of which 347 091 with direct performances.

Heritability is 0.32, equivalent to production, which means that the calves gestation length is explained 1/3 by genetic and 2/3 by environment.

Genetic variability is -10 to +10 days relative to the average of each breed, with a standard deviation of +/- 2.5days.

The proof gestation created by EVOLUTION is expressed in standard-deviation to the breed average

- A bull with a GL proof at -8 days will see her calves born on average 4 days earlier
- A female with a GL proof at + 6 days will see her offspring born 3 days later
- A calf born from a dam with a proof of -8 and a sire with -6 will born 7 days earlier



BENEFITS FOR THE BREEDER

WHICH BENEFITS FOR THE BREEDERS? FROM 800 TO 1500€ / 100 DAIRY COWS / YEAR

Using short gestation length bulls, in average -4 days, on a 100 dairy cows herd could improve by 2 days its gestation length for 4 benefits:

1- Economy in feed costs of 2.6€/ dairy cow ie 260€/ year

2- 2 days improvement in the calving-calving interval for 2€/ dairy cow ie 400€/year

3- In a strict grouped calvings system, 2 cows not culled and 2 less heifers to raise represent 2 x 300€ less additional cost ie 600€/ year or 6€ / dairy cow / year

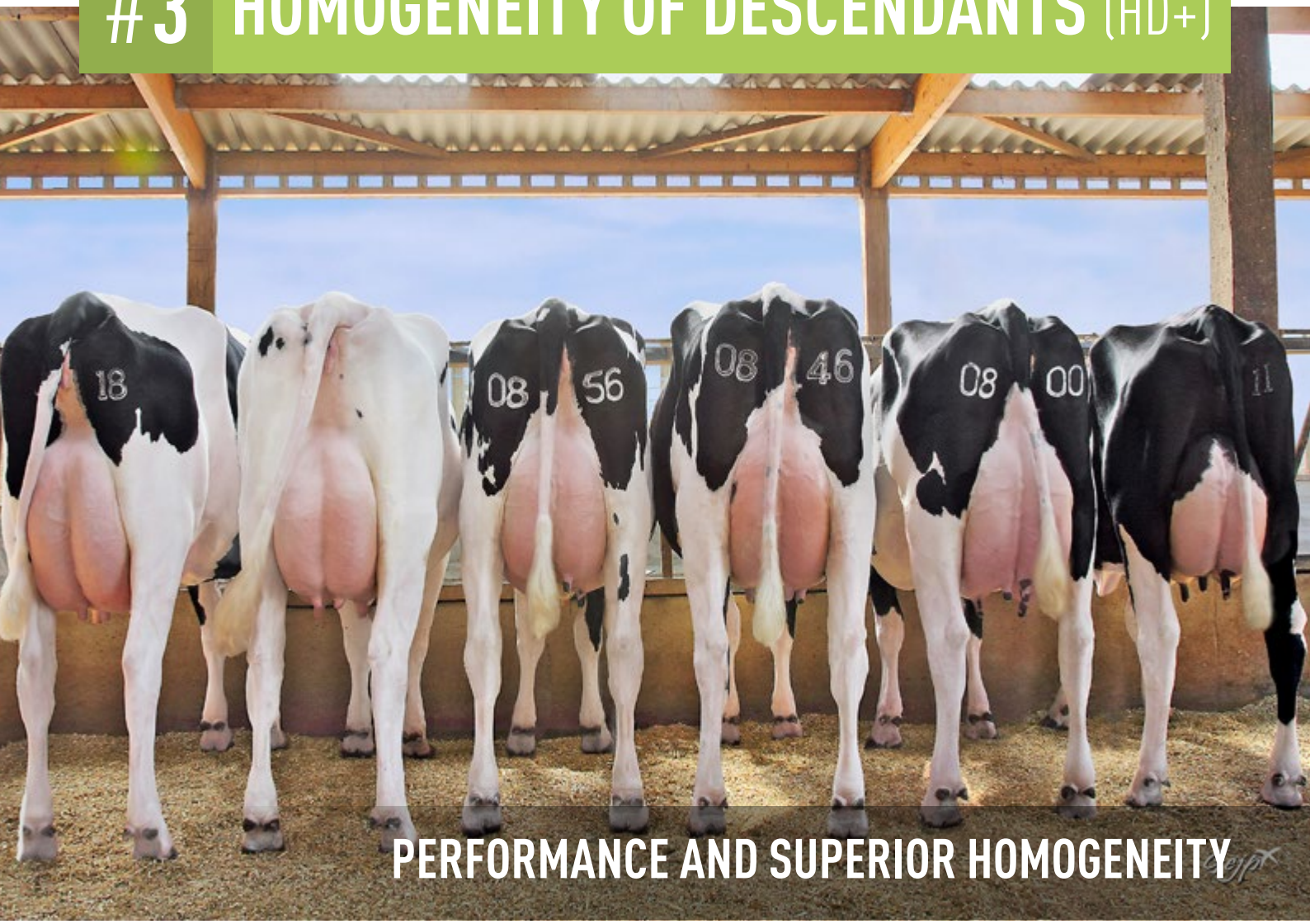
4- Calving better controlled during the birth period and better calving ease, facilitating daily work with time savings

Bibliographical references: Dechow T, Hoards Dairymen, Oct 2017

EVOLUTION EXCLUSIVITY!

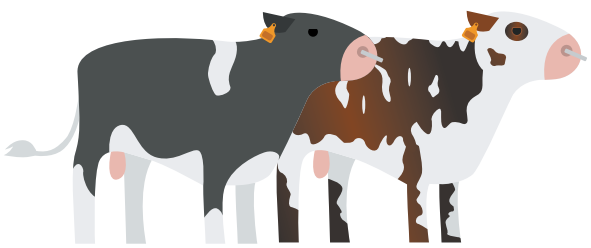
4 INNOVATIONS SUPPORTING GENETIC EFFICIENCY

#3 HOMOGENEITY OF DESCENDANTS (HD+)



PERFORMANCE AND SUPERIOR HOMOGENEITY

« THE RIGHT DNA TRANSMITTED »



WE GIVE YOU TOOLS TO MOVE FORWARD RIGHT NOW:

Our bulls are evaluated

Find them on the bulls sheets:
www.evolution-xy.fr

PRODUCT SHEET: UNDERSTAND AND USE THIS INNOVATION IN YOUR HERD

EVOLUTION International

#3 HOMOGENEITY OF DESCENDANTS (HD+)

HERDS CONTEXT AND CHALLENGES

HOMOGENEITY OF DESCENDANTS CHALLENGES:

To obtain the best possible offspring in relation to the dam.

- When mating a female, one of the main objectives is to obtain a significantly improved progeny on one or more criteria
- The choice of the bull aims to have a strong impact on this criteria. 50% of the sire's genes are transmitted, adding to the 50% of the dam's inheritance
- The genetic value of the offspring fluctuates around the average of the sire and the dam

The challenge of homogeneity of descendants is to be able to obtain a higher and more homogeneous level on a strategic criteria.

PRINCIPLE OF EVOLUTION INNOVATION

WHAT IS HD+ ?

HD+ is the bull capacity to transmit a quality more regularly to his offspring. This is observed on a specific criteria.

Method: the knowledge of the bulls' DNA has made possible to project more than 500 random descendants and to measure the distribution of their genetic level.

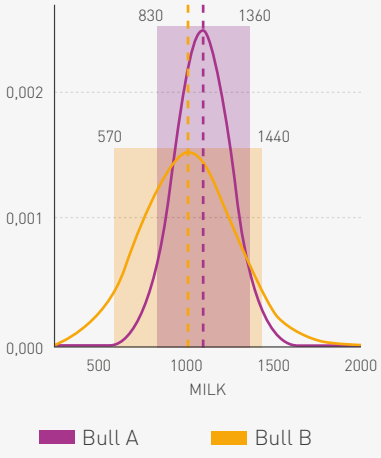
Thus, HD+ bulls are not only very improving on one criteria, but «tested» for their ability to transmit this quality in a more homogeneous way:

- To be labelled HD+, the bull must be in the top quarter in genetic level and in the top quarter in homogeneity of transmission to its offspring (standard deviation of transmission)
- For HD+ bulls, less than 5% of the offspring will be less than 1 genetic standard deviation

Examples :

Bull	LIWAY SIL	NARADJA
Proof	+2,0 Feet & Legs	+1081 Milk
Population standard deviation	+/- 0,3	+/- 300
HD+ bull effect	+25% of homogeneity	+13% of homogeneity

Bull A transmits its genetics potential more homogeneously than bulll B



BENEFITS FOR THE BREEDER

WHAT BENEFITS FOR THE BREEDERS ?

By using HD+ bulls on a female with a significant defect, it will be corrected in a more homogeneous way : the probability having an insufficiently corrected female goes from 17 to 12%.

For example, a female negative in Udder Health (-1.3) mated with NEEKENS HD+ bull in Udder Health (+2.7), the calf will be positive in somatic cells at 88%, against 83% for the average bulls.

For a 100 dairy cows herd with a genetic issue in somatic cells on 20 females, to mate the sensitive female with a bull HD+ in Udder Health, it is 1 to 2 females with 1 more lactation or 600 € savings per year.

The breeder will earn 10% perfectly satisfactory female rate on HD+ couplings.

EVOLUTION EXCLUSIVITY!

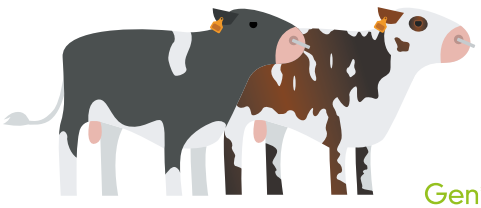
4 INNOVATIONS SUPPORTING GENETIC EFFICIENCY

#4 FEED EFFICIENCY (FE)

GULIETTA
MILK : 10 829 KG
CONCENTRATE : 9.5KG/100L MILK
EVOLUTION FE : +1.0

ISATIS
MILK : 10 759 KG
CONCENTRATE : 11.4KG/100L MILK
EVOLUTION FE : -0.9

MANAGE THE 1ST OPERATIONAL COST OF YOUR HERD



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PRODUCT SHEET: UNDERSTAND AND USE THIS INNOVATION IN YOUR HERD

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#4 FEED EFFICIENCY (FE)

HERDS CONTEXT AND CHALLENGES

THE FEED EFFICIENCY CHALLENGES

Feed : first operational cost in herds

- 62% of the operational costs in dairy herds
- 1st improvement tool of the economic result (2nd: herd turnover rate)
- Herds with the best EBE/1000L have on average 25€/1000L less feed costs

Dairy cows feed efficiency : a universal subject

Whatever the breeding system, from the most extensive to the most intensive, the system valorisation depends on the dairy cow efficiency, its capacity to valorise the available feed.

Étude XPERTIA 2019 dans 529 élevages

PRINCIPLE OF EVOLUTION INNOVATION

WHAT IS THE FEED EFFICIENCY?

- **Difficult subject to tackle**
  - Important expectations but limits to collect reliable and mass data. Complex subject that will require time and several steps to be treated integrally.
  - 1st step: meta-analysis based on international knowledge from basic scientific work.
  - This first step is the beginning of a long process of enrichment by applied research.

- **EVOLUTION provides to breeders a 1st feed efficiency synthesis that values this first stage of work**

- **Concept : select the individuals who best value the feeding over their dairy career:**
  1. Produce more from my available feeding
  2. Eat less feed
  3. Being healthy

- **Product synthesis : available for EVOLUTION bulls and for all genotyped females with EVOLUTION**

  Focus on 0 with a standard deviation of +/- 1 : as for Functional or Morphological- proofs. Relies on elementary proofs (Rel: from 0.5 to 0.95)

Feed efficiency formula

$$FE = \frac{\text{Production}}{\text{maintenance needs}} + \text{Health}$$

Holstein
(Milk+PROT+FAT)-BDC+Health

Normande
(Milk+PROT+FAT)+SYBO-FT+Health

BENEFITS FOR THE BREEDER

WHAT BENEFITS FOR BREEDERS ? A CHALLENGE OF 10% PERFORMANCE IMPROVEMENT

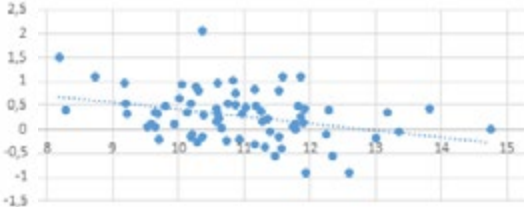
1- Identify the quality of the animals, sort and advance your herd

FE synthesis is available for EVOLUTION bulls and females genotyped with EVOLUTION.

2- Example : 120kg of concentrates of difference between the best and worst cow, therefore 10%

- Sample of 71 Holstein cows with at least 3 lactations registered
- Measurement of the daily production performance and the concentrates consumption
  - The top 1/3 consumed on average 10.4kg of concentrate /100L of milk produced
  - The lower 1/3 consumed on average 11.5kg of concentrate / 100L of milk produced
- **These herds challenges are 5,000€ / year / 100 dairy cows** (50€/cow/year)

link between feed efficiency & consumed concentrates /100L of milk



Mesures terrain EVOLUTION - 2019

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