

GENETIC
EFFICIENCY



DIVERSITY



EXCELLENCE

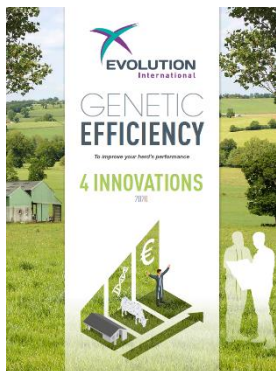


RELIABILITY



THIS DECEMBER PROOF RUN HIGHLIGHTS OUR GENETIC EFFICIENCY

**EVOLUTION IS PROUD TO OFFER YOU
4 NEW INNOVATIONS IN HOLSTEIN TO IMPROVE HERDS PERFORMANCE**



- 1) GESTATION LENGTH (GL)
- 2) HOMOGENEITY OF DESCENDANTS (HD+)
- 3) FEED EFFICIENCY (FE)
- 4) HOOF HEALTH (RLI - RLNI)

**EVOLUTION
EXCLUSIVITY**

*Find more details in
the additional leaflet*

TOP BULLS IN VARIOUS EVALUATION SYSTEMS

LOUXOR : #1 ISU PROVEN BULL

With 210 ISU points and thanks to his first daughters, LOUXOR became the #1 PROVEN BULL IN THE WORLD IN ISU. This incredible bull was first in the ranking for six consecutive proof runs after its release and has remained in the TOP 10 since then. He has 12 commercial sons and many excellent daughters. Indeed, LOUXOR is still the most represented sire in the TOP 100 female ranking with 22% of the total, three years after his first release.

He remains extremely high in protein (0.25) and fat (0.17) content as well as on morphological traits (3.5) and more particularly on feet and legs (2.1). His daughters are very functional with excellent udder health (2.2) and good fertility (1.2).



NACASH : TOP GTPI WITH +2787

NACASH is still #2 available IN EUROPEAN GTPI RANKING with 2787 points. International sire of sons, he has been used widely all around the world. His particularly interesting profile and his performances in various evaluation systems have made him a very attractive bull that has been used by many breeders and breeding companies.

This amazing son of SUPERHERO is perfectly balanced in all traits. He will increase the breeders' income thanks to high milk solids (148). He combines a good fertility (1.7), transmitted by his strong maternal line from UNICORN BLACKSTAR LILLY VG87 family and a faultless functional type (2.3). He provides outstanding udders (2.4) supplemented by ideal feet and legs (1.4). His superb calving ease (6.8) makes him easy to use on heifers.

	911 NM\$
	33 NTM
	4213 PFT
	724 PLI
	362 BPI
	198 ISU

NEW TPI - NM\$ OFFER

OBJECTIVE: PRODUCTIVITY AND FUNCTIONALITY

WINDMILL x GP84 EL BOMBERO x GP84 DIAMOND SE

2708 GTPI - 897 NM\$ - 3965 PFT - 740 PLI - 154 PFI



Ideal to produce long-lasting and productive cows to generate more profitability.
High performance in several breeding evaluation: ICO, PF, PLI, etc.

+1311 MILK +131 SOLIDS +7.7 PL +2.2 UDC BB & A2A2

Available in **conventional** and **sexed** semen.



OSLO RF: MODERN AND BALANCED

SALVATORE RC x GP84 RUBICON x VG85 CASHCOIN

2675 GTPI - 872 NM\$

Perfect to build profitable and functional cows. From the famous GOLD CHIP HERMINE TUAL EX92 family, a renowned strain heavily worked in Europe.

+1211 MILK +5.4 SCE +7.1 PL +2.0 UDC +2.0 FLC

Available in **conventional** semen (and **sexed** semen on order).

OXBOW: EASY AND ALL-PURPOSE

BLOWTORCH x GP84 RUBICON x VG85 CASHCOIN

2644 GTPI - 835 NM\$

From the same strong family as OSLO RF. He combines perfectly production and morphology. He provides strong feet and legs and very well-attached udders.

+132 SOLIDS +2.58 SCS +7.1 PL +2.0 UDC +1.2 FLC

Available in **conventional** semen (and **sexed** semen on order).

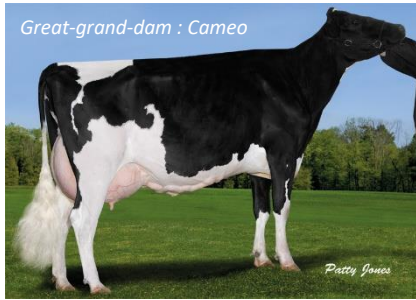


The bull **NEVENLAND** increased its TPI by 43 points thanks to a high level of milk (+1491), good fertility (+1.1) and easy calving guaranteed (+6.8). He provides superb morphology including superbly attached udders (+2.1) and well-made feet and legs (+1.1).

He comes from WILCOXVIEW RUDOLPH CALI EX93 family as the bulls **NOTTINGHAM** and **NEMON**. This strain is recognized to be very productive with a great type and these three bulls confirms impeccably these main traits.

NAXEL also improved its TPI level by 24 points thanks to excellent fertility (1.8) and a gain of 60 lbs of milk. His daughters will be medium-sized with functional udders, particularly adapted to robotic milking.

A DIVERSIFIED AND COMPLETE RANGE OF NEW ISU BULLS



OMAX: UNBELIEVABLE MILK PRODUCTION

BASALT x GP84 HOTROD x ANTON

OMAX comes from the productive Canadian family STANTONS FEDDIE CAMEO EX90. He is the perfect combination of milk and type (+4.0).

+1845 MILK +2.1 UD HEALTH +2.4 PL +3.5 UDC +2.1 FLC

He is available in **conventional** semen.

HD+ for Udder

OVERTOU is newly coming in **sexed** semen. Thanks to his outcross pedigree, he is easy to use in herds. He provides plenty of milk (1006) and solids (0.2 P%) with excellent udders to support it (2.6). **OPROD** is the highest INEL (81) bull available. His daughters will be profitable by keeping feed cost under control through a superb feed efficiency (3.6). OPROD is coming in **conventional** semen.



OFFREDO: SOLID AND BALANCED

DOWNTOWN x JEPSILON x HORA

OFFREDO is ideal to build strong and long-lasting cows in herds. He has an alternative pedigree for more ease in mating. He is available in **sexed** semen.

+2.2% PROT A2A2 +2.1 PL +1.2 CW +1.5 FLC

HD+ for FLC



OKALIBRA: INCREDIBLE PROTEIN & FAT

KP CARTER x VG86 AVALAN SIL x VG89 GESTAR

Excellent son of KP CARTER, he comes from a family with outstanding classifications. He is available in **conventional** semen. His grand-dam participated at SIA 2019 and produced 12 300 KG of milk at 0.37% PROT and 0.53% FAT in 3rd lactation.

+0.44% PROT +0.38% FAT +3.1 PTAT +2.2 U. HEALTH A2A2 & BB

HD+ for Fat, PTAT & UDC

OMEYER P is newly coming in **conventional** semen. This superb polled bull comes from the same family as FINGER and NOZAY P. He enables a richer (0.72 F%) and healthier (3.0) production. His daughters will be medium-sized with functional udders (2.1) and solid feet and legs (1.3). **OGOUENO** performs in PFI (154) as well as in ISU (200). He brings incredible protein (0.36) and fat (0.51) content while maintain high milk (925). He brings functionality and a great feed efficiency (3.3).



OZIL: EASY-GOING AND PRODUCTIVE

KP CARTER x VG86 ÉCLAIR WIL x GP82 MACK COYNE

OZIL comes from a family that excels in longevity with particularly functional cows, characteristics that have been well transmitted. His daughters will be perfectly adapted to milking robots. He is now available in **conventional** and **sexed** semen.

+1302 MILK +1.1 RLNI +1.9 FERTI +2.6 UDC +2.0 FLC

HD+ for Milk, Ferti, UDC & FLC





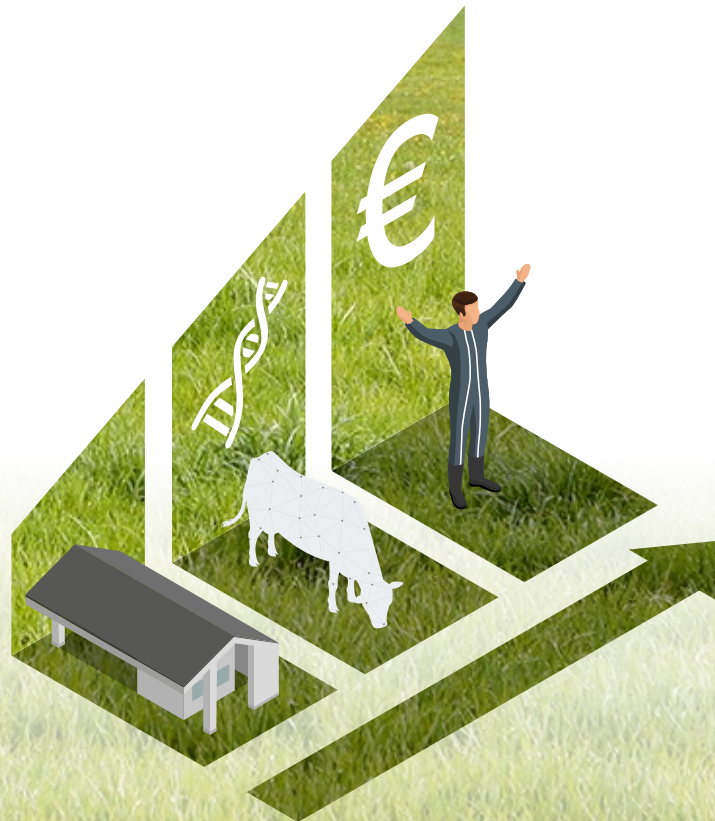
EVOLUTION
International

GENETIC EFFICIENCY

To improve your herd's performance

4 INNOVATIONS

2020



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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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4 INNOVATIONS SUPPORTING GENETIC EFFICIENCY

#1

HOOF HEALTH

GÉNO  SANTÉ

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


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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 times 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



WHAT IS THE NORMAND HOOF HEALTH?

Genosanté 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 daughters : 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

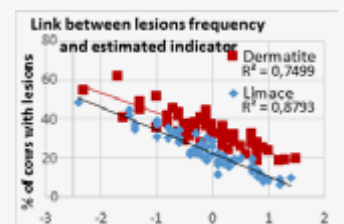
Examples of the genetic proofs effect on bulls with more than 50 daughters:

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%)



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

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4 INNOVATIONS SUPPORTING GENETIC EFFICIENCY

#2

GESTATION LENGTH (GL)



**JOUVENCE, CALVED
4 DAYS IN ADVANCE !**

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


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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.



WHAT IS THE GESTATION LENGTH PROOF?

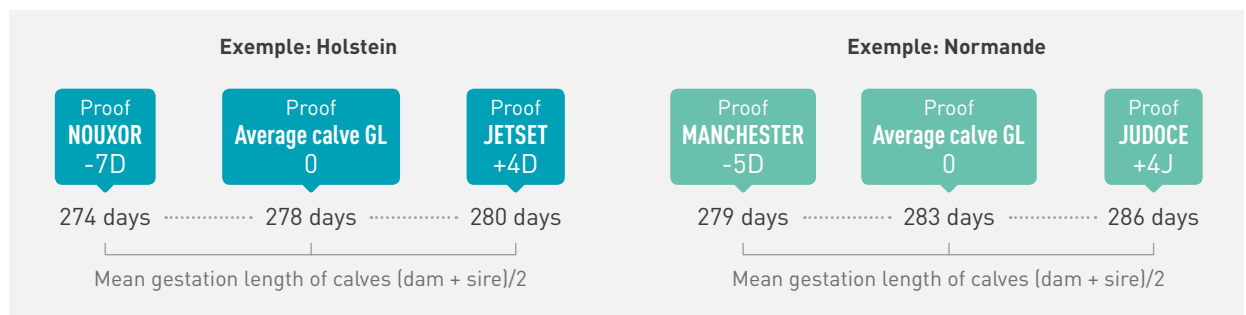
This proof is calculated by EVOLUTION's Research & Development team, following the G-BLUP international indexing methodology, from 476 369 genotyped individuals (401 685 Holstein et 74 684 Normande) of which 347 091 with direct performances.

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



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

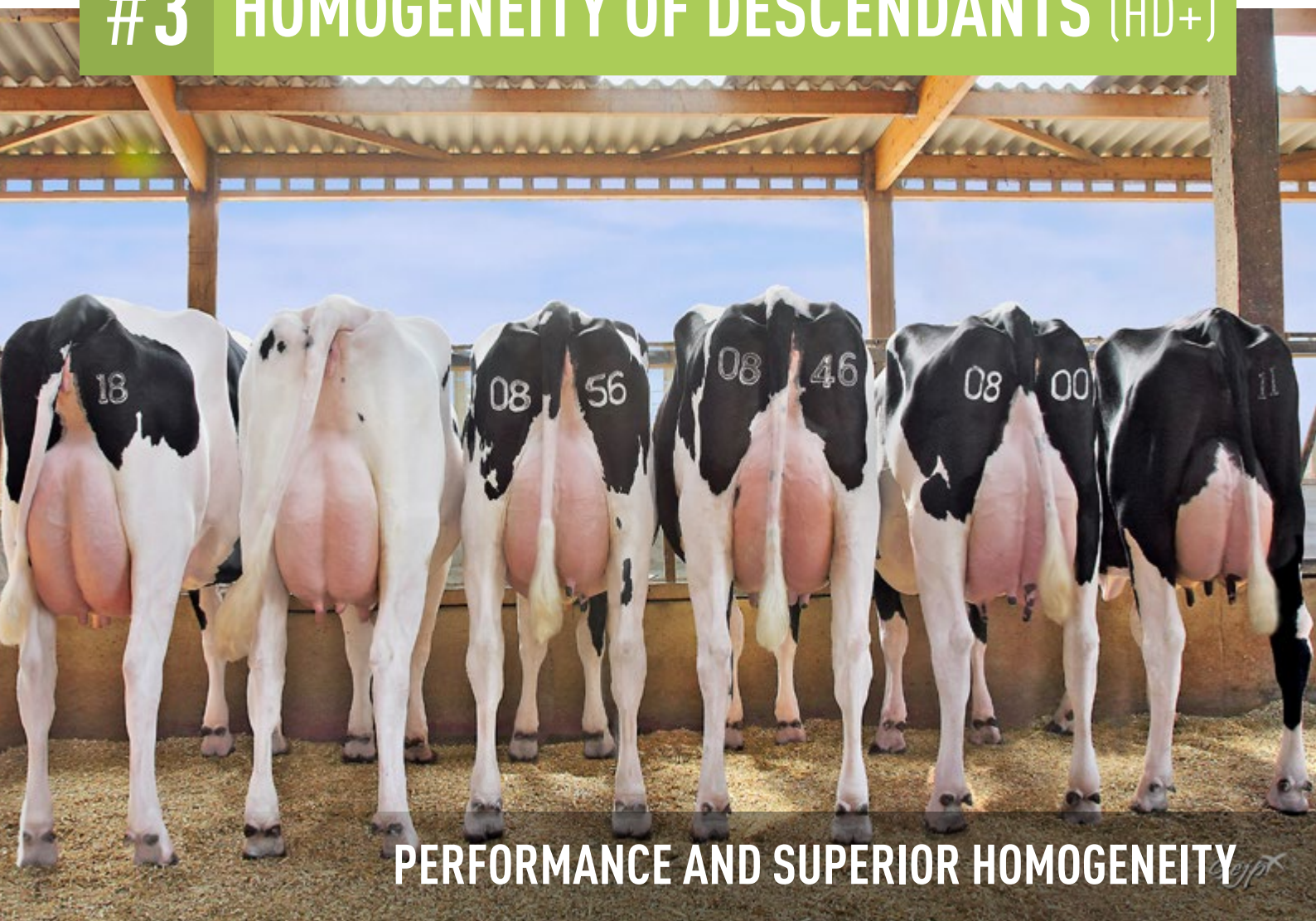
Using short gestation length bulls, in average -4 days, on a 100 dairy cows herd could improve by 2 days its gestation length for 4 benefits:

- 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

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4 INNOVATIONS SUPPORTING GENETIC EFFICIENCY

#3 HOMOGENEITY OF DESCENDANTS (HD+)



« 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

Vitalité à la naissance	93	<div style="width: 93%;"></div>
Vitalité au vêlage	96	<div style="width: 96%;"></div>
CDH	Non porteur	
Homogénéité de descendance	MA ME LAIT TP TS	



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.

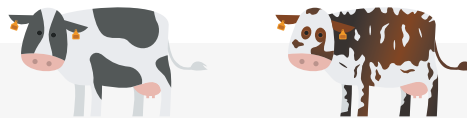
Method: the knowledge of the bulls' DNA has made possible to project more than 500 random descendants and to measure the distribution of their genetic level.

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:

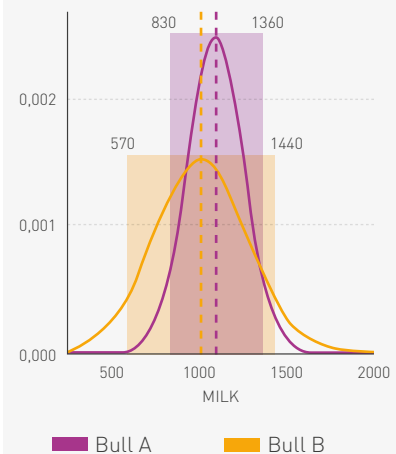
- > To be labelled HD+, the bull must be in the top quarter in genetic level and in the top quarter in homogeneity of transmission to its offspring (standard deviation of transmission)
- > For HD+ bulls, less than 5% of the offspring will be less than 1 genetic standard deviation

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 bull 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.

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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

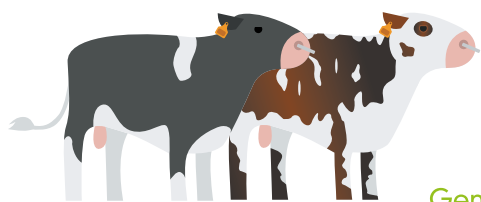
CONCENTRATE : 11.4KG/100L MILK

EVOLUTION FE : -0.9

MANAGE THE 1ST OPERATIONAL COST OF YOUR HERD

WE GIVE YOU TOOLS TO MOVE
FORWARD RIGHT NOW :

< Our bulls are evaluated
with FE proof



Genimprove

Your females are evaluated
by the EVOLUTION genotyping >



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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



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



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



EVOLUTION

International

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