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My connected farm: Proactive real-time breeding management

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Who is Isoporc?

- **Isoporc, is a contract based pork producer.**
  - **Owns 50% by Aliments ASTA and Mario Côté Inc.**
  - **Management 100% on contract based with more than 150 associated producers and 186 breeding sites.**
  - **Production of ± 500,000 pigs/yr.**
  - **Slaughter weight ± 105 - 106kg carcass.**
  - **Management is unique in multi-sources and comingling in 3 sites production all-in, all-out per site.**

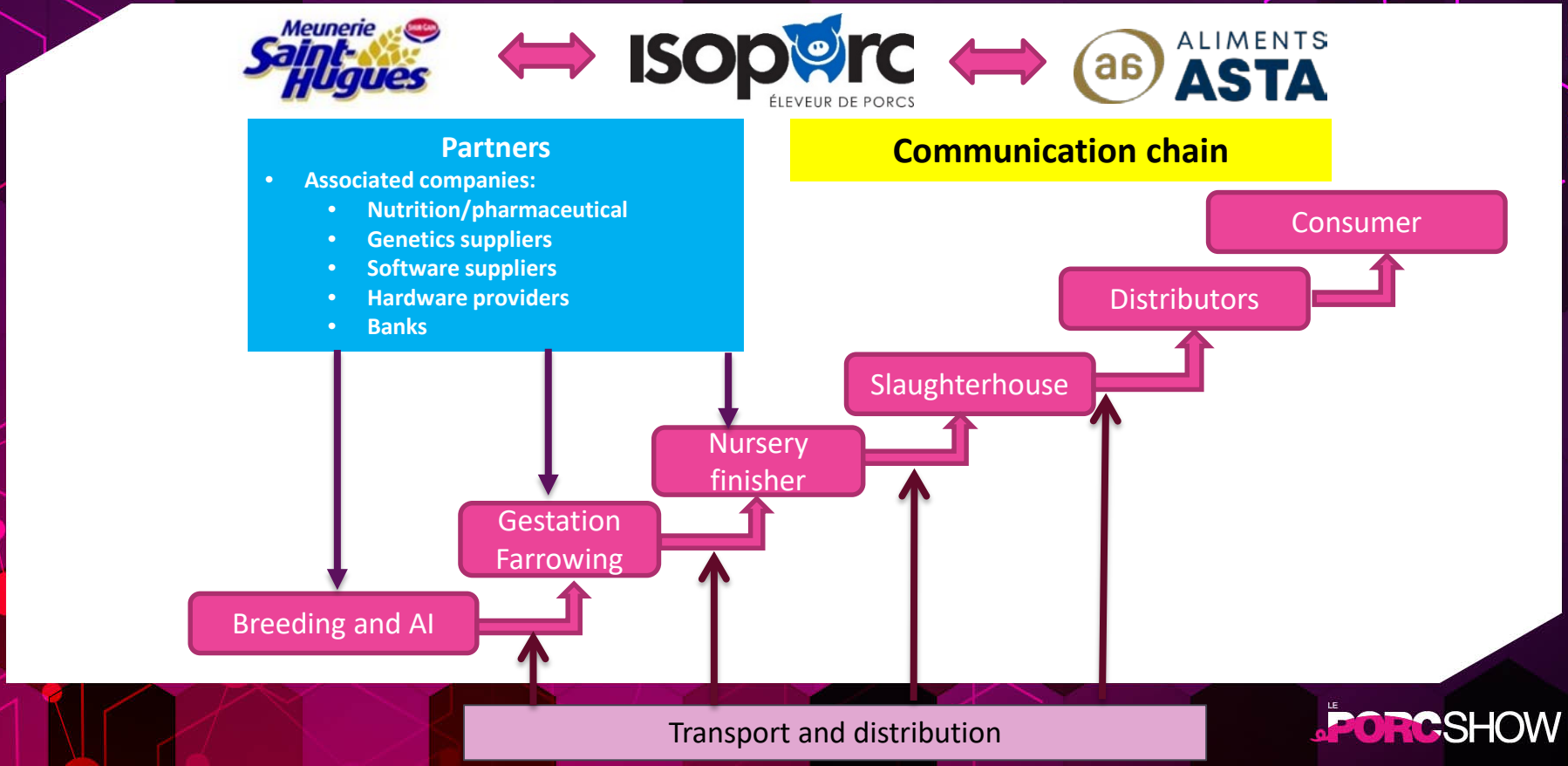
Who is Meunerie St-Hugues?

- Specialized Feed mill: pork-duck feed (Brome Lake Duck)
- Production 6½ days / 24 hours for a volume of more than 200,000 T/yr.
- Supplier in feed and stocks (SSA, vaccines, medications, soaps and disinfectants, etc.) to all Isoporc farms.
- Administrative center of Isoporc-MSH and Gène-Alliance.
- **The plant must be automated and modernized**
  - Implemented since 2015 with full ERP integration.

Project introduction

- **We had been seeking to improve the company's breeding and financial results management for some time now and wanted to obtain this important information more quickly.**
- **The willingness to have this information in real-time came to me following training trips.**
- **We needed to find a breeding management system that was integrated to the mill's operating systems (ERP) to prevent double entry and paper handling.**
- **We needed to facilitate communication between all sectors (B2B) of the company's supply chain.**

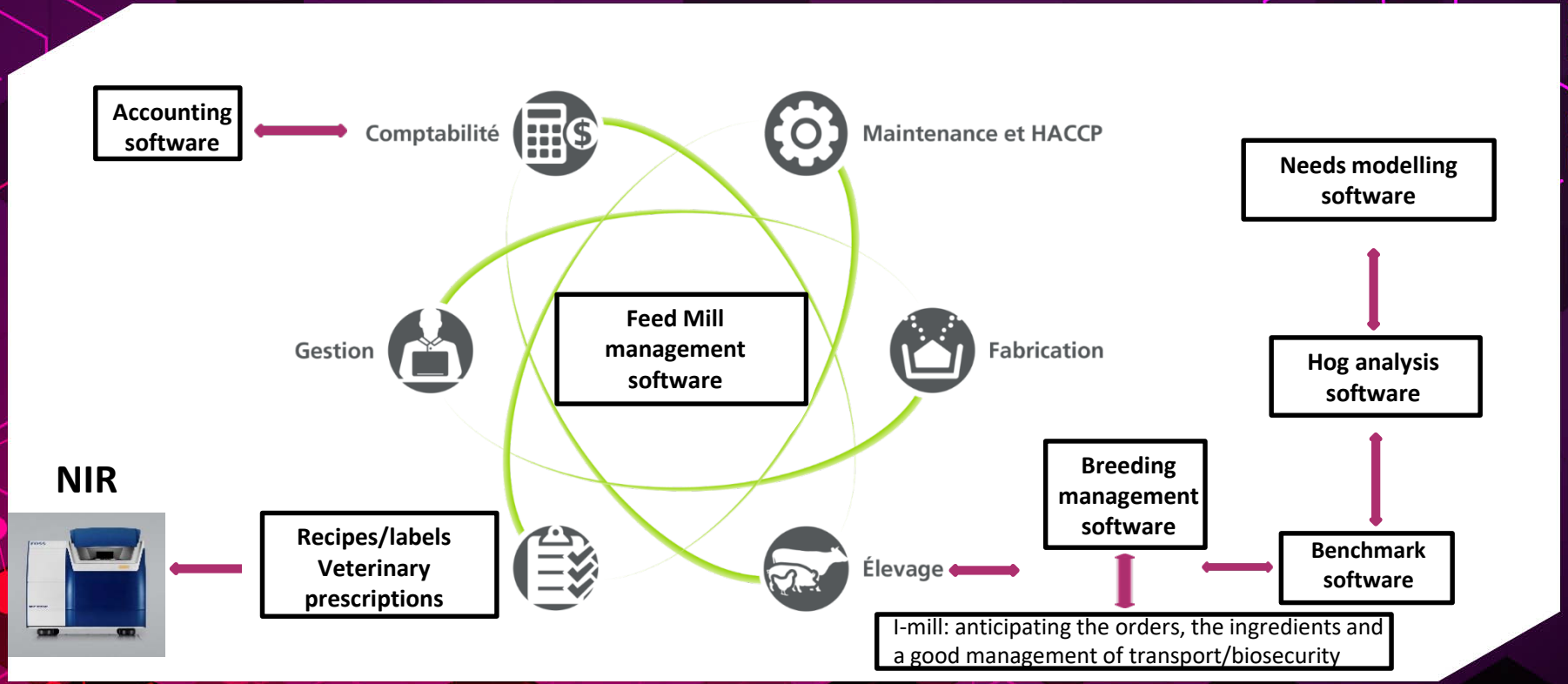
Pork supply chain



My connected farm: proactive real-time breeding management

- **Targeted goal of implementing real-time breeding management**
- **Shifting from passive management (breeding results) to proactive management by obtaining information at the farm.**
  - **Full implementation of the sites as quickly as possible:**
    - **To allow for daily planning according to the production criteria targeted**
    - **For faster reaction time**
    - **For reduced antibiotic use**
    - **With performance indicators (KPI)**
    - **To increase productivity**

Fully integrated ERP solution



Evaluation of current processes and needs analysis

Chronology of events

- **Objective: Replace an old DOS system with new interrelated software, in Windows:**
- **ERP implementation: Phase 1**
- Parallel creation of a compatible breeding monitoring interface, to migrate the data between the old and new software
  - Start of the test closed-out in the fall of 2015
  - Acceleration of the testing and training in 2016
  - More than 300 piglets and pigs closed-out managed continuously.
  - *Go live was* launched on May 29, 2016
  - Running-in and improvement of the software with regular updates (6-7 weeks)
    - Rapid changes to meet our needs.

Chronology of events
Phase 2: Farrowing

- **Intersystem communication - Phase 2**
  - Change from the current herd management software to new breeding management software allowing for data to be entered on tablets, directly in farrowing, to connect all data and generate long-time production and slaughtering forecasts.
  - At the end of 2016, 6 farrowing units are converted and the others follow. Final conversion: August 1, 2017.
  - Advantage of the farm: data entered directly beside the sow, on tablets.
    - Reduced data entry time at the farm (6h/ week for 2,400 sows unit)
    - Fewer office hours worked at the farms (4 days/week).
  - Better production planning (pig flow).

Real-time farm connection

- Requires Wi-Fi or cellphone connection at the phone
- Data can be entered online or offline
- Data sent daily
- Alarms when critical levels are exceeded
- Email notifications or text messages to producers, technicians, veterinarians.
- Answering the needs of insurance companies in relation to risk management.

My connected farm - Farrowing

CAPACITY TO EVALUATE WHAT YOU MEASURE

All data collected daily on your farm is reported, in real-time, into your Maximus Software for the analysis of your production.

YOU CAN USE THE COLLECTED DATA TO PRODUCE MANY TYPES OF REPORTS AND GRAPHS:

ANALYSIS

MONITORING

MULTI-FARM

PROJECTIONS

LISTS & CARDS

Weekly performance monitor
Peter M.

Data From: 10/07/2018 to 10/20/2018
Sites: Pork&Pork

	Week 10/04/2018 10/10/2018	Week 10/11/2018 10/17/2018	Week 10/18/2018 10/24/2018	Total	Average
PRODUCTIVITY					
Litters / Mated Female / Year (LMFY)		2.37	1.32		3.47
Pigs Weaned / Mated Female / Year (PWMFY)		28.3	0.8		39.2
Pigs Weaned/Farrowing Space/Year (PWSY)	253.3	150.4	4.0		148.4
Total Liveborn / Female / Year		33.2	17.5		48.0
Lifetime Pigs Weaned / Mated Female	99.0	65.6	11.0		63.9
Non-Productive Days (w/o Gilt Pool)	0.7	19.1	46.2		14.5
Production Index (w/o Gilt Pool)		54.3	0.6		50.1
Mated Inventory / Farrowing Space		5.2	5.1		3.7
Capacity Utilization (%)		89.6	87.2		63.5
Litters / Female / Year (LFY)		2.27	1.27		3.32
Pigs Weaned / Female / Year (PWFY)		27.0	0.7		37.4
Non-Productive Days (w/ Gilt Pool)	10.6	30.8	64.5		26.4
BREEDING PERFORMANCE					
Total Services	15	75	53	143	47.7
Weaned Sows Bred <= 7 Days	2	50	45	97	32.3
Weaned Sows Bred > 7 Days	0	2	1	3	1.0
Weaned Sows (%)	13.3	69.3	86.8		69.9
Wean to 1st Service Interval	6.5	5.2	5.1		5.2

THE VARIOUS REPORTS PROVIDE DIFFERENT TYPES OF PERFORMANCE INFORMATION.
REPORTS & GRAPHS CAN BE EXPORTED IN EXCEL, PDF OR HTML FORMATS.

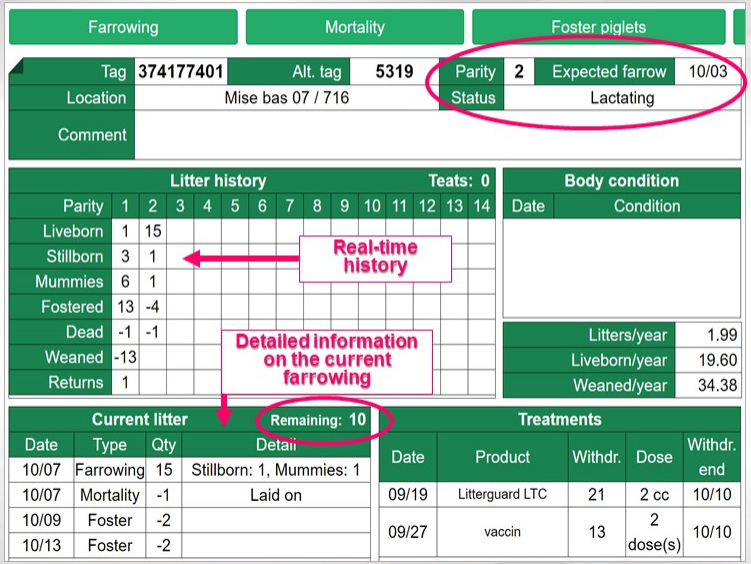
A connected farm in motherhood

A COMPLETE WORKING TOOL

- **User-friendly** interface; intuitive and easy to use icon.
- Operates both **online** and **offline**.
- 3 languages available: French, English, and Spanish.
- ***Bluetooth*** device to connect with a RFID reading stick.

My connected farm - Farrowing

FARROWING | ALL RELEVANT DATA AT YOUR FINGERTIPS



SOW CARDS CAN BE PRINTED:

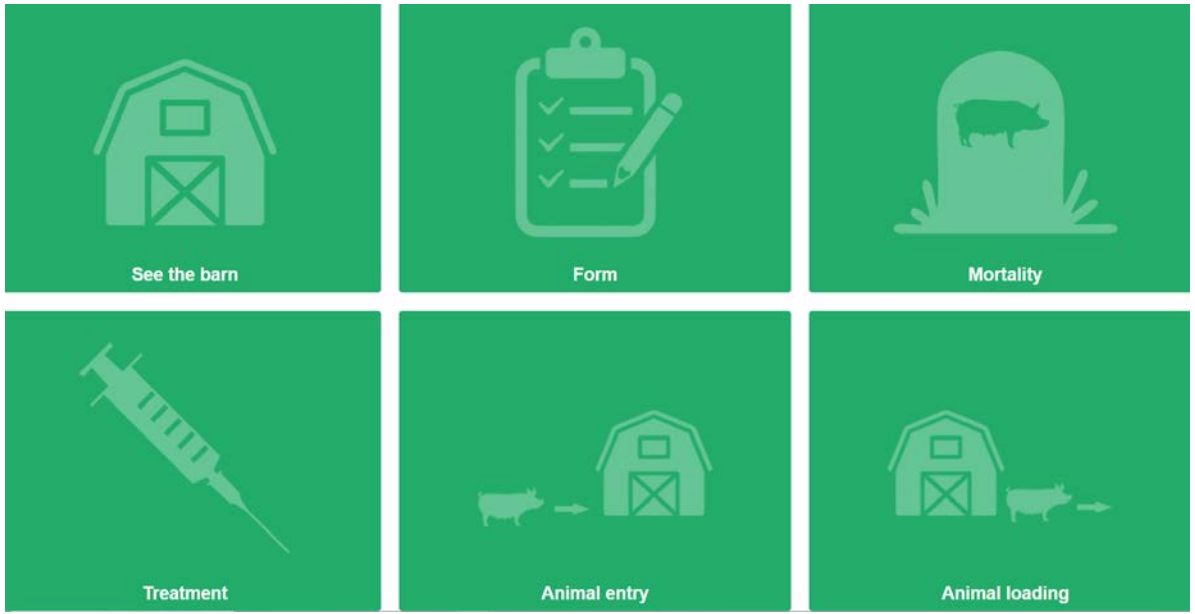
- **Represents huge time savings**
- **The data follows each animal no matter the stage in which they are within the cycle**
- **Data accuracy**

Chronology of events Phase 3: Nursery - finisher

- **Intersystem communication Phase 3: From 2018 to end of 2019**
  - Real-time management with the 186 breeding sites linked to Isoporc. 150 partner breeders and 300 continuous lots
  - Obtaining 3 base data
    - Inputs-outputs-deaths (causes) per piglet-pig origin
    - Entries by farmers on smartphones, tablets or computers.
    - We provided **cellular** connected tablets
    - Better feed program management
    - Real-time inventory monitoring
    - Alarms in case of mortality > set goal.

My connected farm – Nursery and finisher

Real-time browsing in the app

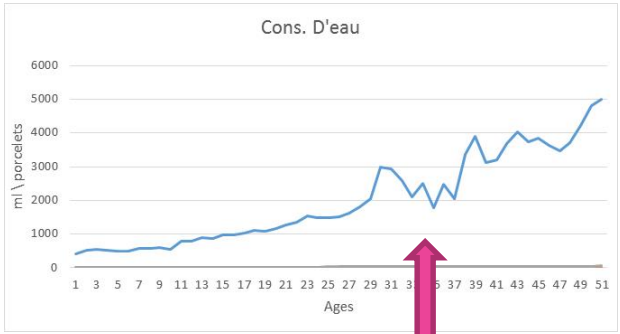


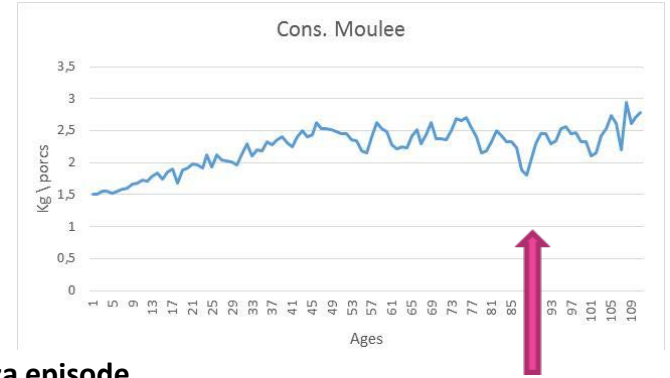
Chronology of events Phase 4: Nursery - finisher

- **Intersystem communication Phase 4:**
  - **Obtaining 2 additional base data**
    - Daily water and feed consumption
    - Prerequisite: have an electronic controller connected to the production site’s breeding management software.
    - Testing and validation among certain breeders in 2019.
    - Fills the requirements of insurances companies related to disaster prevention.
    - Desired implementation: 2020-2021

Chronology of events Phase 4: Nursery - finisher

- **Obtaining at least 2 additional data requires the addition of a consumption measurement control**
  - Daily water and feed consumption
  - Example of consumption curves





Influenza episode

Reduced consumption
Influenza period

Chronology of events Phase 5: Nursery - finisher

- **Intersystem communication Phase 5:**
  - Integration of specialized software for the mill, to manage farm order expectations with logistics planning to optimize transportation (GPS) and respect of biosecurity pyramid.
  - Better planning of volumes to produce in MSH and, consequently, of input requirements in the short, medium and long term.
  - Management of “biosecurity” accesses.
  - Link with the laboratory and NIR (near infrared) to analyze inputs and formulate feed recipes in real-time.
  - Desired implementation: 2019 - 2020.

Chronology of events
Phase6: Nursery-finish

- **Inter-systems communication Phase 6 : coming soon**
  - Info entered directly for **PigSafe** requirements
    - Compatible reports for **PigSafe** et **PigCare (Canadian Pork Excellence)**.
  - Possible transfert to **PigTrace** (traceability).

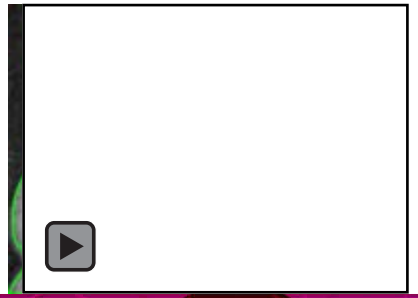
Drop the pen and paper management for an electronic one

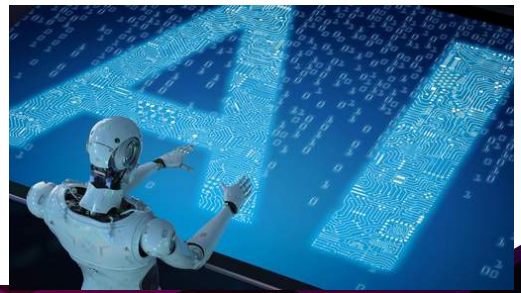
Chronology of events
Phase 6: Nursery - finisher

- **Intersystem communication Phase 6: coming soon**
  - Obtaining the real-time electronic logging of injections or medical treatments
  - Information included in PigSafe (CPE)
    - Report compatible for PigSafe validation (CPE).
    - Advantages of linking the information with ASTA.
    - Link with meat buyers and compliance with medication withholding times.
  - Possible transfer to PigTrace (traceability).
  - Management of production flows (“pig flow”).
  - Management of visits (presences) and lists of tasks to complete.
  - Desired implementation: 2019-2020.

Chronology of events
Phase 7: Nursery - finisher

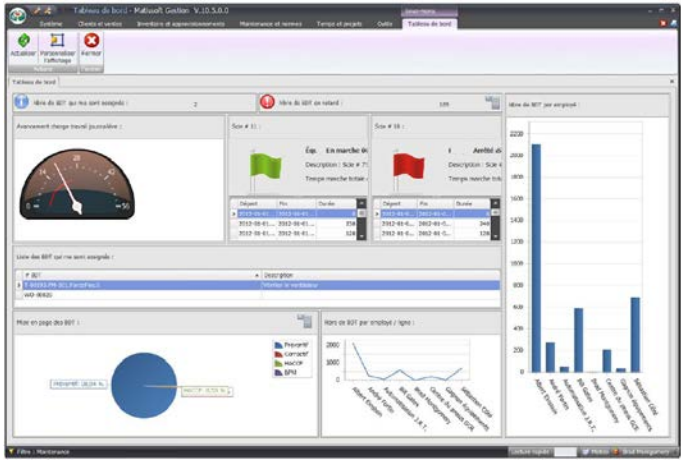
- **Future innovations by integrating AI to breeding: soon a reality.**
- **Measurements with a robot camera and infrared**
  - A genetics partner is working with a provider to model the growth of pigs, with real-time vision, and managed with body temperature. See video links.
  - Desired implementation: 2020…





Management with a dash board, performance indicators and weekly reports

Dash board with performance indicators (KPI)

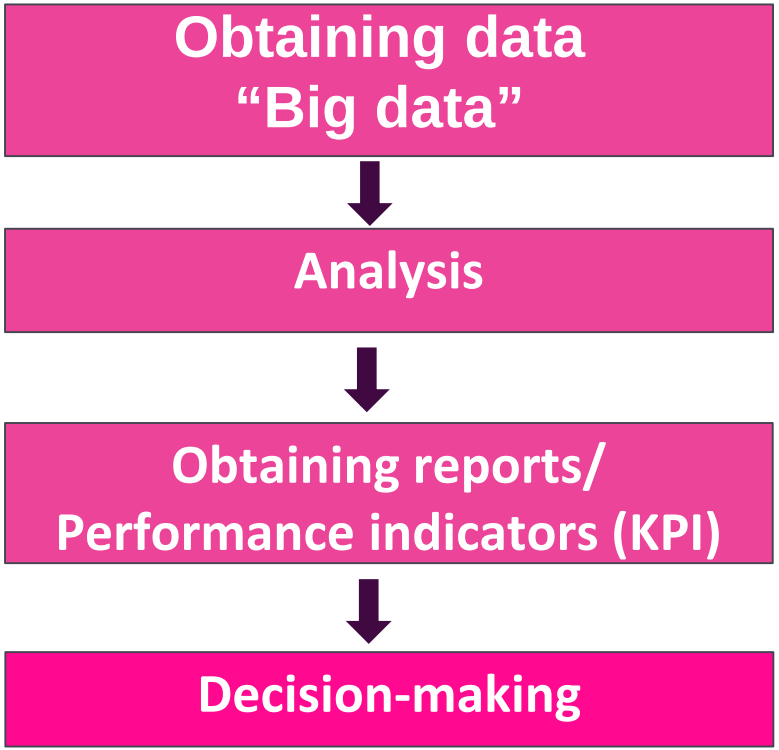


Weekly ranking data and weight strata

	Unité org.
	Isoporc Inc
Séquence	7 479
Poids brut moyen (kg)	103,566
Écart type de poids (kg)	6,95
Strates conformes (%)	91,1
Indice ajusté	111,2
Viande (%)	61,7
Écart type de viande (%)	1,7
Muscle	69,1
Gras	16,7

Poids moyen (strate)	Séquence	Pourcentage (%)
0 à 82.5	24	0,3
82.5 à 87.5	55	0,7
87.5 à 92.5	165	2,2
92.5 à 100	916	12,5
100 à 107.5	2 784	37,9
107.5 à 112.5	1 974	26,8
112.5 à 115.5	725	9,9
115.5 à 118.5	420	5,7
118.5 +	289	3,9

Chronology of events: Summary



Current findings:

- **For the last 3 years now, we have put a lot of energy into improving the management between the different sectors of the company and our partners.**
- **Integration of real-time breeding management is a first, shifting from traditional management to management 4.0 or B2B management.**
- **There are numerous advantages:**
  - Rapid transfer of information at all levels.
  - Better management of the various production parameters to comply with.
  - Better compliance with feed programs.
  - Faster reaction in case of health outbreaks or animal losses. Consequence: reduced antibiotic use.
- **As of yet, 2 1/2 fewer office workers since the implementation, preventing double entry, in addition to the time saved at the farm.**

Current findings:

- **Needing Internet or cellphone connection at the farm is mandatory. A network printer is also needed in farrowing.**
- **The cost of the real-time software per sow is similar to that of other software on the market.**
- **Those involved must be open to change their traditional mending**
- **The different interfaces between the software's makes them user friendly.**
- **To work with local companies in enables faster updates, thus better answering present and future needs.**

Conclusion

- **Future development will lead to simpler management and faster decision-making at all levels: Producers, agronomists, technicians, veterinarians and owners.**
- **Upon using the product(s), we discover other possibilities that will further improve results; and, consequently, reduce production costs.**
- **This is an investment, not an expense.**
- **This project is innovative, unique and serves as a showcase for other organizations and producers with the same needs.**
- **It is accessible to all producers who dare to innovate and are comfortable with new technologies.**