



Anticiper

Fédérer et accompagner

Meat Hygiene: What kinds of tools for food operators?

Brice MINVIELLE ; Project Manager in Meat Quality and Safety
Fresh and processed meats Department, IFIP, France
brice.minvielle@ifip.asso.fr



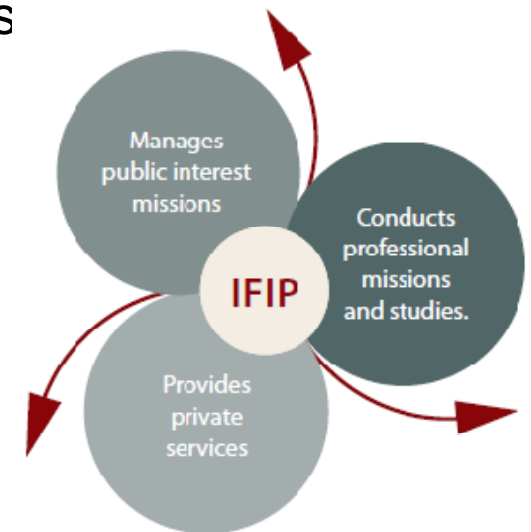
Canadian Meat Council 91st Annual Conference
Halifax ; May 4- 6, 2011

What is IFIP ?



■ IFIP - The French Pork Industry Institute

- R&D company (Association ; 11 M€ budget)
- Provides key supportive input along the pork food chain:
 - to sector-based trade, technical and business development organizations
 - to sector-based businesses
 - to government agencies and authorities
- In 4 broad fields
 - Genetics
 - Techniques in pig farming
 - Fresh meat and processed products
 - Economics
- 80 MSc/PhD/DVM and technicians
- 3 experimental platforms



IFIP : the meat department



Gilles Nassy

The fresh meat and processes product department

Technological quality



Patrick Chevillon



Pierre Frotin



Antoine Vautier



Pierre Le Strat



Jean-Luc Martin



Martine Carlier



Gérard Daumas



Mathieu Monziols

Animal

Meat

Processed meat

Grading

Hygiene quality



Alain Le Roux



Brice Minvielle



Arnaud Bozec



Etienne Pierron



Pascal Garry



Carole Feurer



Mariem Ellouze

Animal / Meat

Processed meat

Identification

Shelf-life

Context (1/2)



■ Meat Hygiene:

- “All conditions and measures necessary to ensure the safety and suitability of meat at all stages of the food chain.” (Codex Alimentarius, CAC/RCP 58, 2005)
- WHO, Monograph series n°33, 1957:
 - “To prevent transmission of disease to man and to provide a safe, wholesome product for his consumption
 - reduction of losses in meat and its by-products and prevention of disease transmission to domestic animals”

■ (EU) Regulations : until the 90's

- Centered on Veterinary Inspection at slaughterhouse level
- Defined rules with precise means for meat processing

Context (2/2)



■ EU Regulations : from 1993 to 2002-2004

- 1993 : 93/43/EEC on the hygiene of foodstuffs
 - Partial transfer of responsibilities to food business operators (FBO)
 - Increasing freedom for FBO to achieve goals : ie HACCP principles
 - Encourage the development of Guides to Good Hygiene Practice
- 2002-2005 : Food Law and « Hygiene Package »
 - Transfer of responsibility : FBO are responsible for ensuring the fulfillment of food law at all stages of the food chain
 - Competent authorities are required to monitor and verify that FBO comply to food law : must maintain a system of official controls and surveillance and other monitoring activities
 - Regulation define the results that must be achieved but leave to each FBO the choice of means

■an increase in FBO's needs for tools

What kinds of tools?



■ What sort of tools?

- Basic tools
- Operational tools
- Expert tools

■ What kind of use?

- Collective vs Individual

■ What kind of control on its use?

- Open vs controlled access

■ Who designs the tools?

- Authority vs private company vs "public structures" vs FBO

Basic tools : Guides (1/3)



■ 1994-1995 :

- Guides to good hygiene practice (GHP)
 - Beef, pork, lamb : slaughterhouse, cutting rooms
 - Delicatessen-caterer-meat processing industry
- Guide for the application of HACCP principles for the red meat industry
- Developed by FBO ; used on a voluntary basis ; validation by competent authority not wanted

■ 2007-2011 :

- Guides to good hygiene practices
 - Farms producing animals : ruminants, pigs, poultry
 - Farms producing feed for animals
- Guide to GHP and for the application of HACCP principles
 - Beef, pork, lamb : slaughterhouse, cutting rooms
 - Delicatessen-caterer-meat processing industry
- Developed by FBO ; used on a voluntary basis ; validation by competent authority wanted (independent scientific evaluation)

Basic tools : Guides (2/3)



■ 2007-2011 :

- Developed for FBO by R&D institutes of each species
 - IFIP for pork and delicatessen-caterer-meat processing industry
 - With FBO representatives and
 - ◆ Quality Managers for industry
 - ◆ Veterinarian, technicians, farmers for farm
- Interaction / Synergy along food chain and with others species
 - Common interests on interaction / synergy :
 - ◆ To maintain (improve) a high level of protection
 - ◆ To have an equivalent level in requirements (multi-species)
 - ◆ To share common positions : competent authorities ; clients (distribution)
 - Same methodology, different schedules, regular discussions
 - ◆ By species : shared list of hazards (farm : asymptomatic carriage...)
 - ◆ Feed : list of hazards of all animal species

Basic tools : Guides (3/3)

■ Use on voluntary basis / Validation by Authority

- Once officially validated, a Guide is a public reference document that can be used by third parties (authorities, clients)...

■ Field use

- Meat industry
 - Release of unvalidated Guides on the field
 - Extensive training on methodology
 - ◆ To adapt the Guide to each factory
 - ◆ To be able to justify their choices (authorities, clients)
 - ◆ Red meat : 2007-2008; 3 sessions training (5 d.); >250 QManagers
- Farms
 - Release of unvalidated Guide + Application manual (14 000 ex.)
 - Training of prescribers : veterinarians, technicians
 - ◆ Legislative context ; Guide/Manual
 - ◆ Audit : 229 questions based on the Manual

Operational tools

■ Microbiological control plan :

- 1996 : Guide for Microbiological Control Plans
 - Guidelines for hygiene verification/monitoring : carcasses and meat cuts
 - Process hygiene indicators: Enterobacteriaceae, Pseudomonas, Salmonella
 - Batch analysis ; sampling plans ; limits (satisfactory/unsatisfactory) ; actions
 - Voluntary but widely used and recognized (official quality schemes)
- 1997: Collective surveillance of hygiene criteria
 - Results sent on a voluntary base, anonymously analysed, collective report
 - Database (+90 000 samples): factories representing > 60% production
- 2005 : Hygiene monitoring with Control Charts
 - Cumulative control charts ; moving average (5 weeks sliding window)
- 2008: Standardized control charts (objectives, efficiency, cost)
 - Augustin et Minvielle (2008) Food Control, 82-97
- 2010 : Harmonized criteria for meat exchanged between FBO

Expert tools

■ Microbiological shelf-life determination:

■ Different tools available :

- Microbiological shelf-life testing
- Challenge test
- Predictive microbiology (Sym'Previus ; RMT on Microbiological Shelf-Life)

■ Predictive microbiology:

□ Goals of Sym'Previus (www.symprevius.net) :

- ◆ Determine shelf lives and improve food safety
- ◆ Develop new products
- ◆ Better understand and quantify microbial behaviour
- ◆ Strengthen HACCP plans

□ Examples :

- ◆ Optimisation of the formulation of smoked sausages
- ◆ Impact of carcasses cooling on meat shelf-life
- ◆ Poster : Impact of meat packaging type on the shelf-life of pork chops

Expert tools : example 1

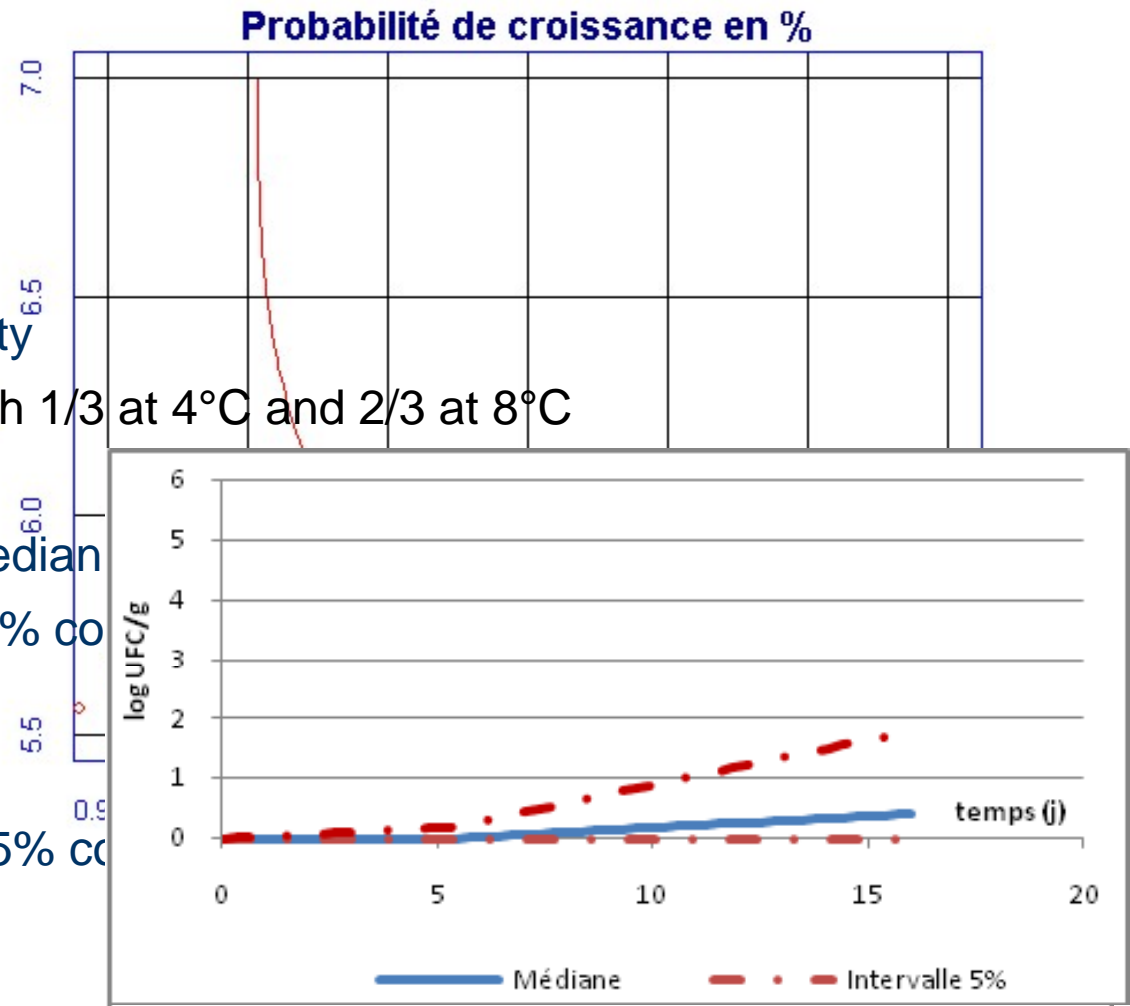
Smoked sausages formulation

- Beef meat and pork fat ; cold smoking ; 16 days expected :

- pH : 5.66 ± 0.07
- Aw : 0.954 ± 0.010

- L.monocytogenes :

- Expected to grow :
 - with 90% probability
- Shel-life estimation with 1/3 at 4°C and 2/3 at 8°C
 - No : 1 cfu/10g
 - 16 days : 2 log ; median
 - 16 days : 5 log ; 95% co
- 2,5% lactic acid
 - No : 1 cfu/10g
 - 16 days < 2 log ; 95% co



Expert tools : example 2

Impact of carcass cooling on meat shelf-life

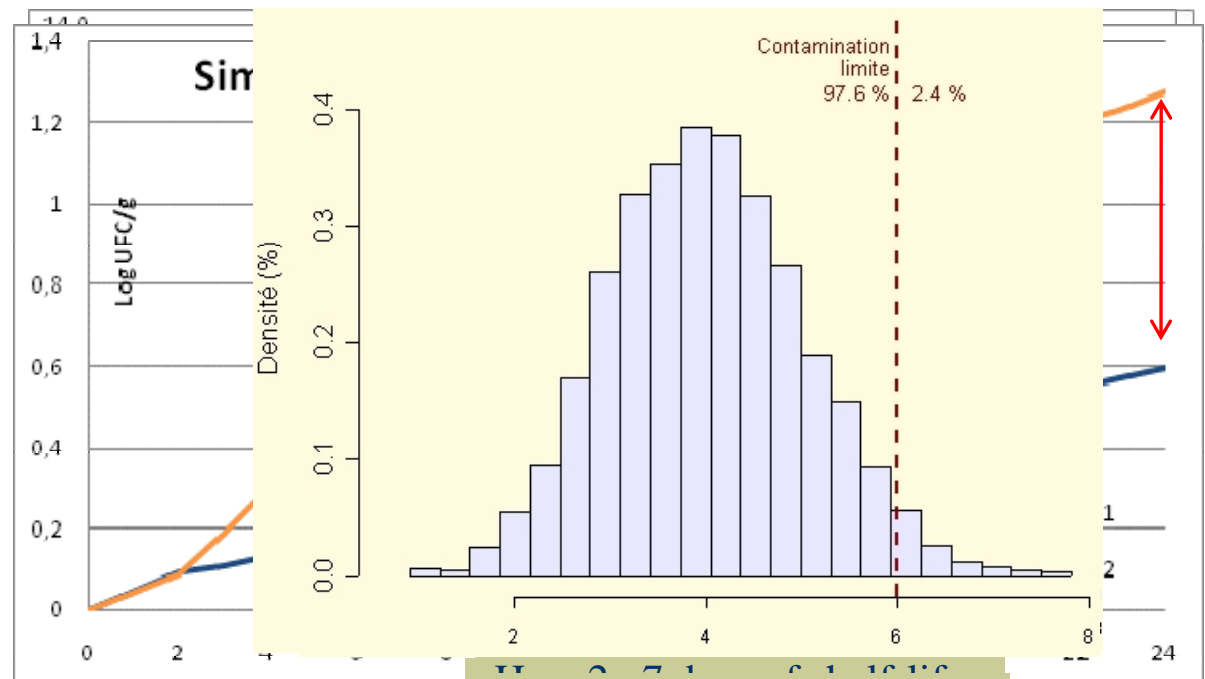
- Cooling of 2 carcasses
 - Same slaughterhouse
 - Similar characteristics (grading, weight)
 - Differences : time ; position

Cooling kinetics

- Core temperature
- Air temperature
- Surface temperature

Shel-Life

- Initial contamination
- +6% unsatisfactory
- - 2 days shelf-life



Ham 2 : 5 days of shelf-life

Conclusions

■ Changes in EU regulations: transfer of responsibilities

- Increased FBO's needs for tools
- Tools designed to help FBO to fulfill their obligations
- Tools still need to be designed to maintain/improve hygiene :
continuous monitoring of process, decision making...
 - To maintain / develop competitiveness
 - To answer to society demands (animal welfare, health, environment...)

■ Tools are:

- Useful if used by FBO : design, mastering, feedback
- ...just tools : means to achieve goals
 - Basic conditions need to be fulfilled : biggest challenge

■ Tools design : field expertise

- Scientific studies, projects : public fundings
- Field studies, projects : access to plants, public/professional funds
- Share information : trust

EU Food Law and Hygiene Package

■ Key obligations for food business operators

- **Safety** : Operators shall not place on the market unsafe food or feed
- **Responsibility** : Operators are responsible for the safety of the food and feed which they produce, transport, store or sell
- **Traceability** : Operators shall be able to rapidly identify any supplier or client
- **Transparency** : Operators shall immediately inform the competent authorities if they have a reason to believe that their food or feed is not safe
- **Emergency** : Operators shall immediately withdraw food or feed from the market if they have a reason to believe that it is not safe
- **Prevention** : Operators shall identify and regularly review the critical points in their processes and ensure that controls are applied at these points
- **Co-operation** : Operators shall co-operate with the competent authorities in actions taken to reduce risks

