

Dealing with post weaning diarrhea

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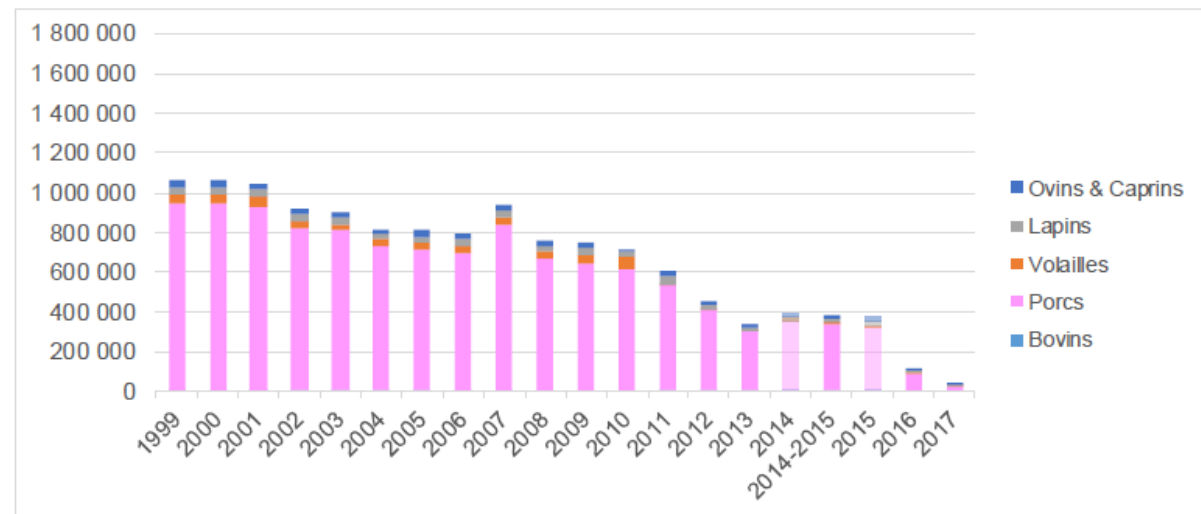
Diarrhea in post weaning facilities in France

- **Diarrhea = colibacillosis**
 - F4 / F18 strains
- **Lawsonia intracellularis / brachyspira spp.**
 - Very few cases
 - One found in 10 years at the practice (organic production without cleaning/disinfection procedures)
- **PEDv (InDeL strains)**
 - 6 clinical cases all bound with piglets importation or transport
 - Serological study (5399 on 540 farms, 37 + (FP ?)) (*Corrégé et al., 2018*)

Historical way of colibacillosis management

- Use of antibiotics in starter diet
 - Colistin in 1st intention
 - Low cost
 - Good efficacy
 - Other antibiotics if resistance to colistin
 - Aminosid (neomycin, apramycin, spectinomycin)
- Other ways
 - Powders containing ZnO in top feeding
→ illegal

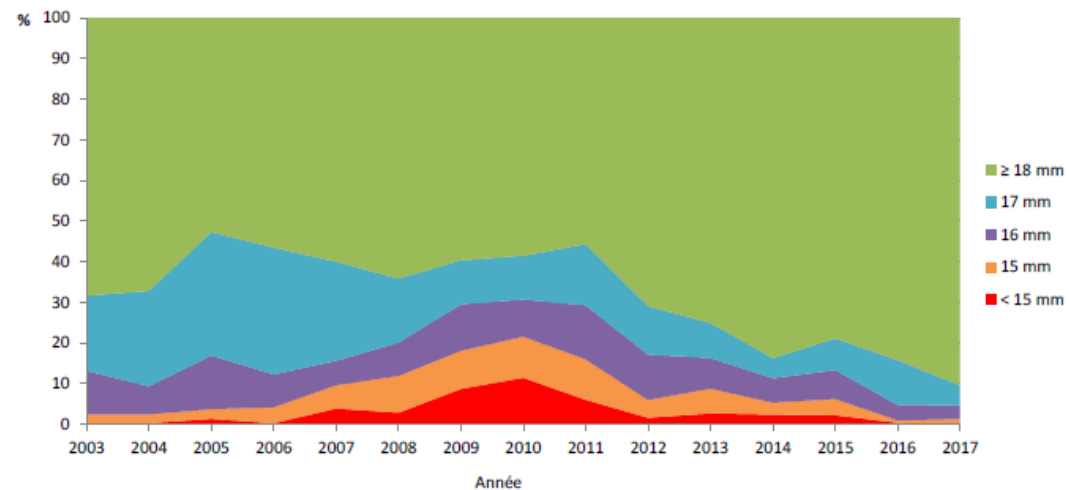
Weight of animal treated through the feed with colistin (tonnes) (Rapport Anmv, 2018)



2016 : a big change in the French legislation

- Colistin
 - Can only be used if presence of clinical signs (prevention forbidden)
 - Not anymore possible to treat in starter diet
 - Distribution length
 - Maximum 7 days
- Zinc Oxide
 - Allowed at the same time
 - EU authorization for Gutal
 - Used in 15% of the herds
 - But we know this won't be available for a long time
- Vaccination
 - Development of Coliprotect
 - F4 in the 1st period
 - F4/F18 lately → Temporary authorization

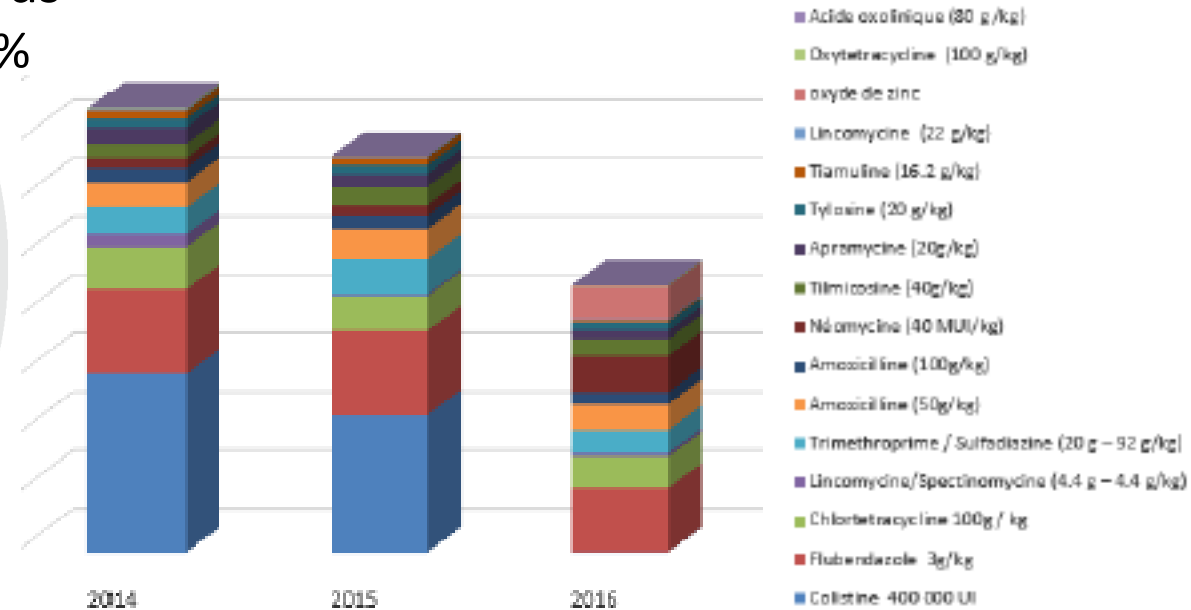
Figure 14 : Proportions relatives des diamètres de zone d'inhibition <15 mm, à 15 mm, 16 mm, 17 mm et ≥18 mm autour du disque de colistine (50 µg) pour les *E. coli* isolés au cours de pathologie digestive chez le porcelet (n min. : 296 (2005) ; n max. : 776 (2011))



Digestive *E. Coli* resistance to colistin (Resapath, 2018)

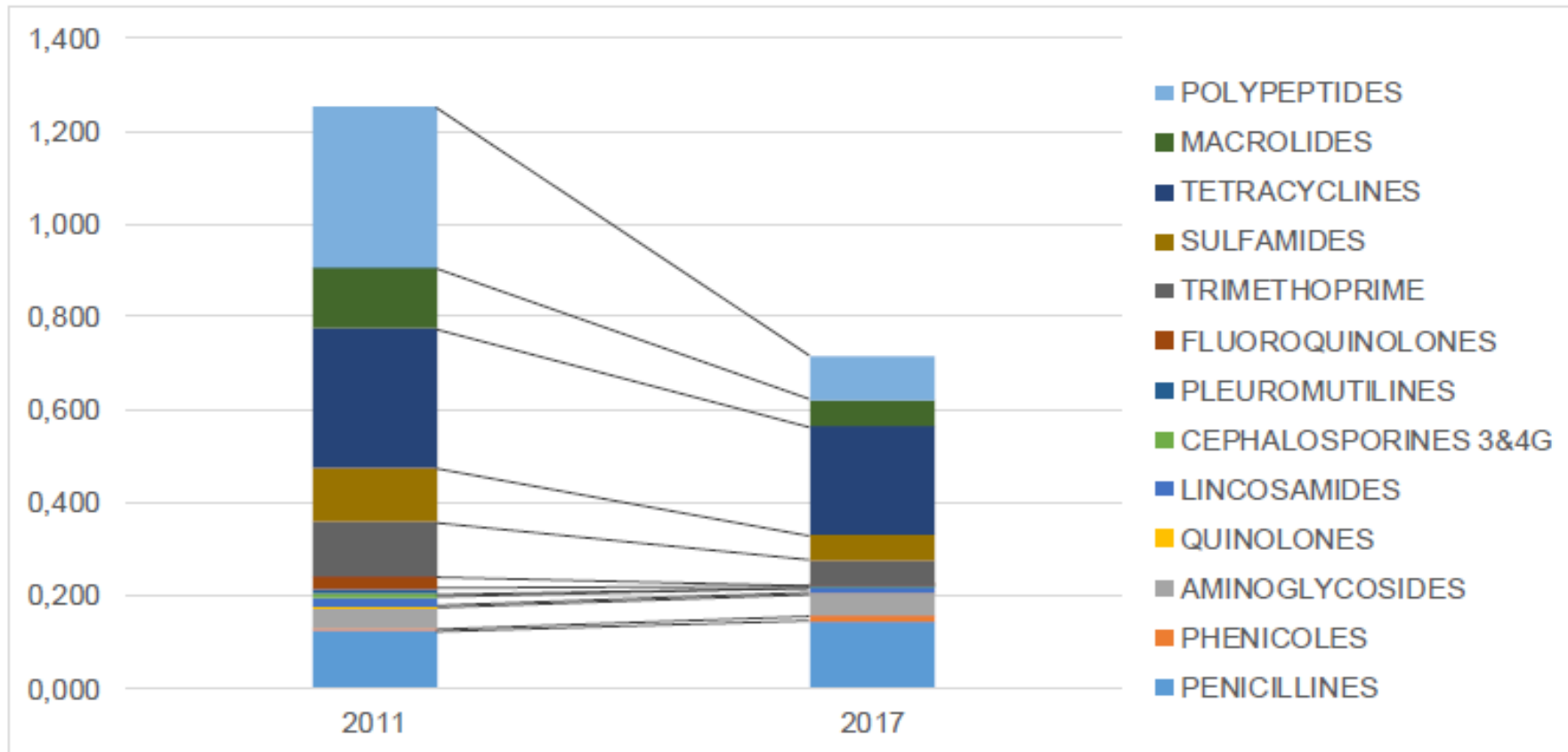
What is the actual situation ?

- No treatment in feed → around 60 % of the herds
 - Punctual treatment through dosing pump → 40%
- Zinc → 15%
 - Restriction on the use (dilution of PS manure...)
 - Reduction of the feed intake
 - Lower growth
- Aminosid in starter diet → 15%
- Colistin → nearly no treatment anymore in feed



Use of antibiotics and ZnO in starter diet in one private company

Antibiotics

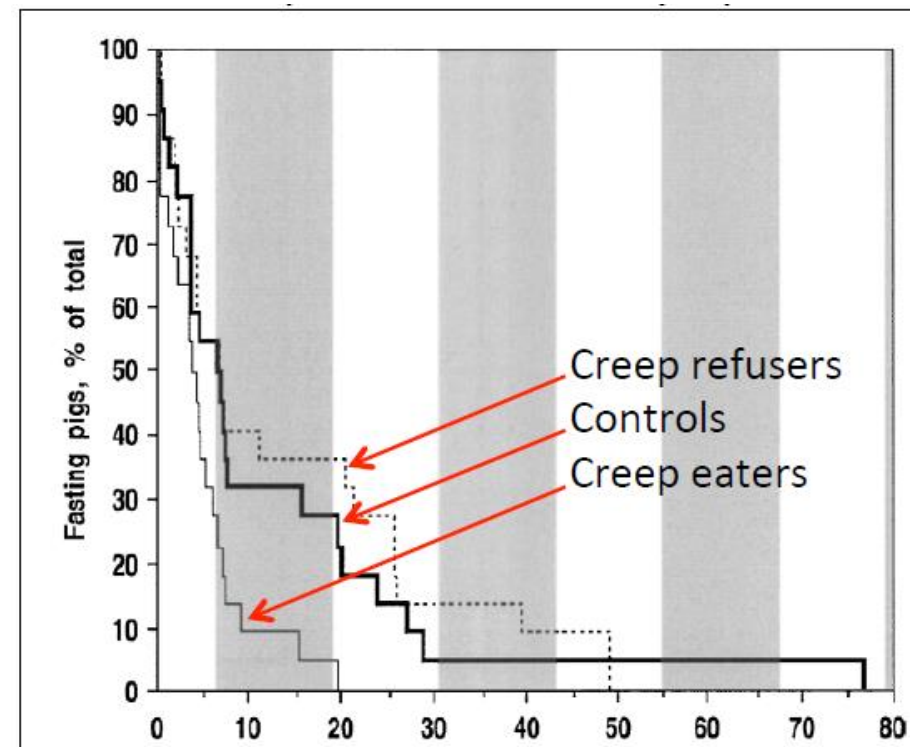
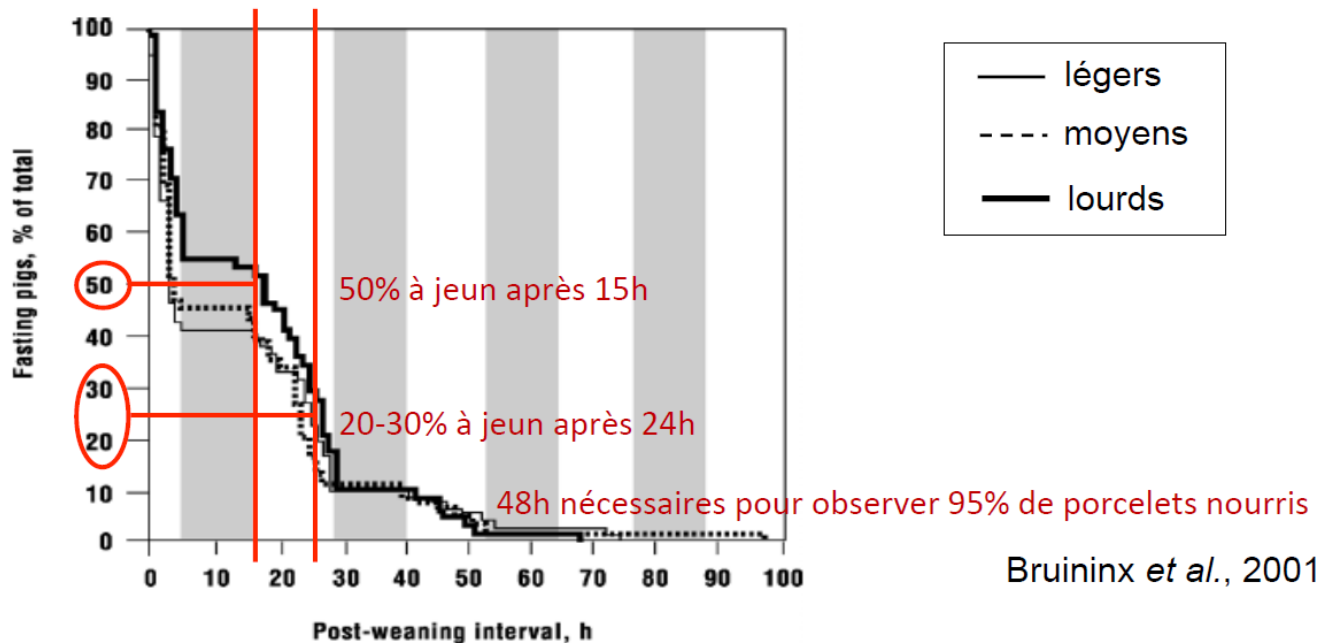


Use of antibiotics in pig production (ALEA), Rapport
Anmv 2018

Main risk factors ?

- Management
 - Weaning age ?
 - Not the age in itself but the heterogeneity
 - Weaning weight ?
 - Probably
 - Subpopulation with a poor weight (<5kg)
 - » Adoptions
 - » Neonatal diarrhea
 - Sometimes the big ones !
- Buildings
 - One of our biggest problem
 - Few investments in French herds for the last 20 years
- Feed
 - Lot of improvements done by the feed industry
 - Reduction of the non-digestible part of the protein...
 - Big competition between feed companies. Some are specialized only in starter diet
- Genetic
 - Not a risk factor in my opinion
- Health
 - Co infections (Influenza / PRRS...)

Feeding behavior after weaning



- Importance of feed distribution in farrowing unit
- Importance of the light → pigs sleep during the night
- The biggest do not obviously eat the fastest

Feed

- The piglets have to start eating as soon as possible
 - Teach them in farrowing unit
 - 3 times per day with low quantities
 - Same feed as in PS for 5 days before weaning
 - Appetence of the feed
 - Use of gruel (mix water and feed) to enhance the appetence of feed → pay attention not to delay the problems
 - Check the water access on all pipe
 - Intake objectives
 - 21d : 450 – 500g/piglet
 - 28d : 800g/piglet
- In PW
 - Specific attention to the smallest ones
 - Elimination at weaning of the piglets that should not be weaned
 - The feeders have to be « closed » at the maximum
 - Just a line of feed at the base of the feeder
 - Especially if diarrhea on big pigs
 - Continuous access the feed → no restriction during the day
 - Appetent feed
 - Pellet
 - Gruel

Feed

- Formulation

- On piglets with a low weaning weight
 - 21d old piglets (obj : 6kg) → 20% < 5 kg
 - 28d old piglets (obj : 8kg) → less than 5% < 5kg
- Use of pre starter diet up to 6 – 7 kg more and more common in France
 - Low levels of protein
 - Highly digestible raw material (plasma, fish protein, biscuits)

- Formulation

Par kg d'aliment	1 ^{er} âge	2 ^{ème} âge
Age, jours	< 40-45 j	< 65-70 j
Poids, kg	< 12	< 25-35
ED, kcal		
EN moyenne, MJ	10,5	10
mini	10	9
maxi	11	10,5
Cellulose brute, g	30 - 35	30 - 40
Matières grasses, g	< 50	< 100
Mat. azotées totales, g	210 - 230	180 - 210
Lysine dig. /EN, g/MJ	1,25 - 1,30	1,15 - 1,20
Lysine digestible, g ⁽²⁾	13,1	11,5
Méthionine + cystine dig., g	8,0	7,0
Thréonine dig., g	8,5	7,5
Tryptophane dig., g	2,5	2,2
Calcium, g	10	10
Phosphore total, g	7	7
Phosphore digestible, g	3,5	3,5

Water

- Access to water
 - Bowel → 1/18 piglets
 - Nipples → 1/10 piglets
 - Water flow (1l/min), pressure...
- Water quality
 - Bacteriology
 - Choice of the water treatment
- Water lines
 - Regular flushing of water lines
 - ...





MANAGEMENT

French production

- Farrow to finish herds mainly
 - Objective : to get the good number of pigs / batch to fill up the buildings
 - No less
 - No too much to avoid overload and performance reduction
 - Low prices of 8 and 30 kg pigs if small numbers

Few examples

- Herd A

- 600 sow herd (Axiom genetic), 7 batches weaning at 28d (12,8 weaned / litter) , no collective medication

- Weaning weight : 8,2kg/pig
- No adoptions after 48h
- 1 starter diet standard (3,5kg/piglet)

- Diarrhea issues

- Colitoxicosis → sudden deaths between 42 and 49d (0,5 – 2%) (F4 strain)
- Reduction of the cases
 - Work on 2nd diet formulation (decrease of Protein – 19,5% → 18,5%; same level of digestible lysin)
 - Acidification of water
- Actual situation : 0,2% of death due to colibacillosis
- ADG 8-30kg : 535g/d

Few examples

- Herd B

- 600 sow herd, Danavl (for 3 year), 7 batches (14,5weaned /litter), weaning at 28d, problems of diarrhea in PS

- Weaning weight : 7,3kg
- Adoption after 48h : 7% of the piglets
- 2 starter diet (one up to 7,5kg)

- Historical program for colibacillosis

- Colistin when diarrhea
- Coliprotect F4/F18 for 2 years (2016 – 2017)

- Actual situation

- No more cases, no vaccination
- Work on water quality (water treatment adapted to the water quality, water lines disinfection between batches...)

Few examples

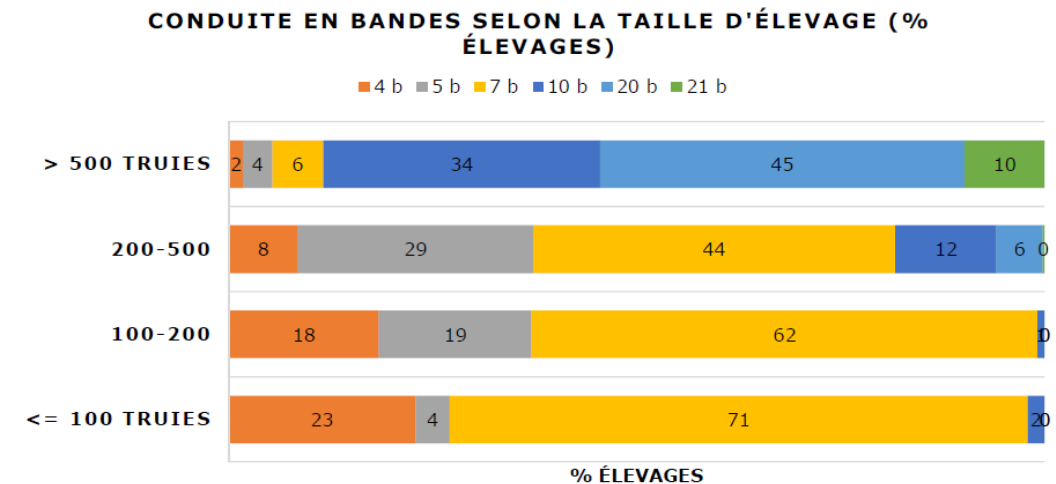
- Herd C
 - 700 sow herd (Nucleus), 7 batches, weaning at 21d (13,2 weaned/sow) , no problem of diarrhea
 - Weaning weight : 6,3kg
 - No adoption after 48h
 - One starter diet (6kg/piglet)

Quality of the piglets at weaning

- Hyperprolificity
 - Limit → quality of the piglet
 - More than the weight in itself, the main problem in my opinion is the heterogeneity in one batch
 - Colostrum intake
 - Heterogeneity in the age
 - » Amplified if weekly farrowings
 - Cross fostering / early weaning / inversion of litters...
 - » *Danish guidelines : 6 sheets in your guidelines*
 - In this case, insurance are sometime needed
 - ZnO
 - Vaccination
 - *Antibiotics...*

Quality of the piglet at weaning

- Batch management
 - One strength in my opinion of French pig production
 - Piglets with an homogeneous age
 - Sometimes double lactation for foster SOWS
 - But piglets stay in their batch





BUILDINGS



Ventilation

- Many problems in farm
 - Many different system
 - Not always easy to control
 - Digestive problems
 - 1st source of call for ventilation control in PS and farrowing unit
 - Old buildings
 - Do not always fit with the elevation of productivity (overload)
 - Wear-off
 - ...
- Ventilation control done at the practice in PW in 2017
 - Reason
 - Cannibalism, ear necrosis : 8
 - Diarrhea: 7
 - Check up : 4
 - Respiratory disease : 4
 - Death percentage : 3
 - Bad climate : 2
 - Percentage ok ?

Conception

- Small pen / small room
 - Best : 20 - 22 piglets / crate
 - 2 litters / crate and remove the smallest one
- Access to feed
 - 5cm min /piglet (best 7cm)
- Floor
 - Fully plastic slated floor for good comfort (and easy to wash)





MEDICAL PREVENTION

Coliprotec F4/F18[®] vaccination

- Clinical case
 - 550 sow herd, 7 batches, weaning at 28d, Danavl (13,8 weaned/litter, mean weaning weight à 26d : 7,4kg). Feed produced on farm
 - Starter diet (bought) for piglets with low weaning weight (1 to 4 kg depending on the weaning weight)
 - But still colibacillosis troubles
 - Controlled with colistin (2 to 4% of death rate)
 - Settlement of coliprotec F4/F18
 - 1st batch : 1,2% death, no treatment
 - 2nd batch : 0,8%, no treatment

Acidification

- Mix of organic acids
 - Formic, lactic, acetic...
 - Frequent use in water in PS
- A tool in the PW diarrhea management
 - But not 100% efficient

Other products

■ Examples

- **Probiotics** : Yeast, lactic bacteria...
 - **Prebiotics** : Oligosaccharids (starter diets) → link with the microbiot
 - **Phytotherapy** : Algae / vegetables extracts
 - **Essential oils** : Thymol / Carvacol
 - **Immunity and maintenance of gut integrity** : vitamin E, Se, aspirin, paracetamol...
-
- Efficacy: documented *in vitro* but not always *in vivo*
 - Few field study and not always consistent
 - Complementary tools but not a solution always efficient

Conclusion

- Dealing with postweaning diarrhea without ZnO and antibiotics :
 - Easy in 50 – 60% of the herds
 - Ok with short treatment with dosing pump in 20% of the herds
 - Problematic in 20% of the herds mainly because of housing problems