Therapeutic deficiencies in the pig sector

Meeting of 18/11/2022

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Changes in deficiencies since the last meeting in November 2020:

Favorable trend for:

- Post-weaning colibacillosis, a major gap that has become more minor.
- Neonatal diarrhea due to E.coli or Clostridium, major gaps now being resolved, thanks to auto-vaccines or recent vaccines.
- The gap on the post-partum of sows, currently being resolved, thanks to import authorisations then ATU of HEMOGEN.
- The resolution of gaps on ileitis and leptospirosis, thanks to recent vaccines

Less favorable trend for:

- Enterococci or rotavirus neonatal diarrhoeas, due to the absence of effective or available vaccines
- Unsatisfactory local anesthetics for castration

	Meeting of 27/11/20	Meeting of 18/11/22
MAJOR priorities	**1. Post-weaning colibacillosis** **2. Influenza** ***3. Streptococcus suis*** • **Brachyspira** • **Neonatal diarrhoeas: E.coli, Clostridium, enterococci, rotavirus**	**1. Enterococci or rotavirus neonatal diarrhoeas** **2. Influenza** **3. Anesthetics for castration** ***4. Streptococcus suis*** **5. Brachyspira**
Minor priorities	• *Haemophilus parasuis* • Post-partum sows • Sows genital infections • Anesthesia	• Post-weaning colibacillosis • Neonatal diarrhoeas due to E. coli • *Glaesserella (Haemophilus) parasuis* • Sows genital infections
Resolution in progress	➢ Ileitis **(thanks to new vaccine – MA 2019)** ➢ Actinobacillosis **(thanks to auto-vaccines)** ➢ Leptospirosis **(thanks to a vaccine – MA 2016)**	➢ Post-partum sows ➢ Actinobacillosis **(thanks to auto-vaccines)** ➢ Clostridium neonatal diarrhoeas **(thanks to recent vaccines)**
Existing solution		☑ Ileitis **(thanks to new vaccines – MA 2020 & 2019)** ☑ Leptospirosis **(thanks to a vaccine – MA in 2016, marketed in 2019)**

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Post-meeting notes (in blue)

Pathology	**Problem encountered by the sector*:** **PhV:** Pharmacovigilance (unsatisfactory efficacy or safety as perceived by the sector) **Disp:** Availability, shortages **Reg:** Regulatory issues (cascade application, withdrawal period, restricted access) **0 VMP:** No appropriate veterinary medicinal products **0 TS:** No therapeutic solution	***Problem type** **Ph** **Disp** **Reg** **0 VMP** **0 TS**	**Alternatives identified**	**PRIORITIES** **Major: M** **minor: m**
Neonatal diarrhoeas due to enterococci **or rotavirus**	**No vaccine available** Enterococcus: the drastic reduction in antibiotic therapy has not reduced its prevalence and its involvement in diarrhoea. Rotavirus causes significant problems. In the field, procedures are sometimes put in place to recontaminate sows with piglets diarrhoea. **No vaccine still available in the field: marketing planned in Dec for SUIGEN Rota Coli (MA of 28/06/22)** injectable emulsion for pigs (Virbac). 1st pig vaccine against E. coli **and** porcine rotavirus. Inactivated, adjuvanted vaccine for vaccination of sows to protect piglets from neonatal diarrhoea. Rotavirus type A (predominant in the field), but what about cross-protection on type C sometimes encountered? Cross-protection has not been demonstrated by specific studies but the relevance of the vaccine strain and the trial strain for clinical studies has been positively assessed.	**0 VMP (vaccine)** **Disp**	Use of **autovaccines**, efficacy difficult to assess. **SUIGEN Rota Coli** (**AMM of 28/06/22)** – see opposite A live vaccine is licensed in North America (Merck NCE Pro System available in the US) against Rotavirus /Coli / Clostridium. 3 import requests in 2021: all rejected by ANMV (2 live strains of rotavirus, no safety data). Rq: Authorized in Spain.	**MAJOR NO. 1**
Influenza	**Current vaccines ± effective.** Assessment of PhV declarations, for illustrative purposes: RESPIPORC FLU 3: 17 declarations of lack of efficacy FR (8 B / 7 O / 2 N) EU signal detection > signal refuted (58 cases / 15 N / 12 O/O1 / 7 B) FLUPAN H1N1: 5 declarations of lack of efficacy (3 B / 2 N) Sub-reporting as known to all => important to **continue reporting** Dominant pathology in fattening pigs with insufficient efficacy in these animals. Inadequate vaccination schedule and problem of interference with maternal immunity. Evolution of strains in the field => importance of Resavip monitoring.	**PhV**	RESPIPORC FLU3, FLUPAN H1N1 Updating influenza vaccines in light of the new genotypes identified will be easier with NVR thanks to the possibility of using the multistrain approach for the vaccine, but this remains dependent on the interest of MA holders. HIPRA GRIPORK vaccine with MA in Spain: import possible (no request recorded to date). See interest in successively combining 3 vaccines? (see Dutch team's publication) Alternating 3 different influenza v	**MAJOR NO. 2**
Anaesthesia for castration	The vast majority of French pigs are castrated. Recommendations well governed by the law: **lidocaine as an intra-testicular injection authorised, but not very effective and frequent post-injection haemorrhages (referred to the IFIP)** (no **PhV** declarations recorded to the ANMV to date).	**PhV**	- SC injection (infiltration) of PROCAMIDOR or PRONESTESIC (procaine + epinephrine) with MA for pigs (see opposite) - Isoflurane (ISOFLUVET) authorised in piglets (see RCP (anses.fr)	**MAJOR NO. 3**

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	SC injection (infiltration) of PROCAMIDOR or PRONESTESIC (procaine + epinephrine) is also possible (MA for pigs), but procaine is almost not used in the field as it is not validated by the IFIP protocols. Any other off-label prescription exposes the responsability of the veterinarian. **No practical anesthetics**, **fast and safe,** e.g. ointment. Practical difficulty related to the speed of processing action, synchronisation of the operation and users' safety during processing. **Problem of farms practising castration** and not IMPROVAC = majority of French pigs, including outdoors, particularly when late slaughter is imposed by the specifications. *Reminder:* Live castration without anaesthesia (legally possible until the end of 2021) is prohibited since January 2022.		- Improvac: possible alternative but which poses difficulties downstream (re-organisation of slaughtering chains, installation of "noses" on slaughtering chains, etc.) - Breeding of whole males = desired by the majority of French veterinarians.	
Streptococcus suis	**No commercial vaccine.** Autovaccines ± satisfactory.	**0 VMP (vaccine)**	**Autovaccines** (*S. suis* = the most frequent request) ± satisfactory **Antibiotics:** βLactamines (Cephalosporins) EcoAntibio project on immunisation by the mother	**MAJOR NO. 4**
Brachyspira	**No commercial vaccine** (complex development - no possible isolation - PCR identification) The susceptibility of brachyspira strains must be monitored (strains less pathogenic in France than in other countries such as DE, NL, DK, SP where highly pathogenic strains and development of resistance) => remain very vigilant, particularly on the situation in Belgium.	**0 VMP (vaccine)**	**Macrolides** **Limited use of auto-vaccines** (no strains to be proposed in France as the bacteria is too difficult to isolate). Autovaccines a priori used in Spain. New **Brachy RB Pigs ATU (Ceva-Biovac)** signed on 20/06/2022 for this auto-vaccine.	**MAJOR NO. 5**
Post-weaning colibacillosis	**Slightly less frequent problem** => priority changed from Major no. 1 to minor. *Reminder:* Commercial vaccines (according to the SPC) are used on sows to prevent neonatal diarrhoea and are **without action on post-weaning colibacillosis diarrhoea.** COLIPROTEC F4/F18 vaccine, but for pigs of at least 18 days: risk of infection between the end of immunity transmitted by the mother and that induced by vaccination after 18 days of age (weaning at 21 days and diarrhoea possible from the following days). Results not systematic. Problem particularly for acute diarrhoea linked to enterotoxinogenic E coli F4 positive. F4/F18 correspond to 60-70% of isolations => problem for the other 30%.	**PhV**	**Antibiotics** **COLIPROTEC F4/F18 vaccine** but for pigs of at least 18 days (see opposite). Zinc oxide (but soon stopped)	**minor**

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Colibacillosis neonatal diarrhoea	**Commercial vaccines** rarely cross with strains isolated from the field and are **weakly effective.** **Recent vaccines:** SUISENG COLI /C (MA dated 07/2020) and SUIGEN Rota Coli (MA dated 06/2022) only cover a small proportion of neonatal diarrhoea because they contain strains against which sows are already vaccinated. Multifactorial etiology of diarrhoea (virus + bacteria) complex to identify. **Lack of diagnostic tools on the virulence of strains.** Problem of updating therapeutic regimens (amoxicillin LA, for example, depending on the physiological stage) and oral treatments for diarrhoea under the mother. **Risk** with regard to **antibiotic resistance** given the high consumption of antibiotics (and orally) for these indications. **Inadequate treatment regimen** (Amoxi LA)	**PhV**	**Autovaccines** regularly requested for lack of efficacy (but difficulties in identifying pathogenic strains). 11 requests recorded at the ANMV in 2022. Field use of retro-contamination. **Antibiotics** (see risks - column opposite). **Vaccines - recent MA**: SUISENG COLI /C and SUIGEN Rota Coli (see comments opposite).	**minor**
Glaesserella* parasuis ****ex. Haemophilus***	**Commercial vaccines ± effective** (PORCILIS GLASSER - Intervet MA dated 2004 and SUVAXYN M HYO PARASUIS - Zoetis MA dated 2008) and not always available. SUVAXYN shortage since 2018. Uncommon, sporadic disease. The issue of strain typing remains problematic. No cross-protection between different serotypes. **Strains typing problem** because the laboratories do not seem to use the same techniques, hence difficulties in validating the lack of interest of commercial vaccines (type 4 for one of them or type 4 and type 5 for the second, which also includes mycoplasma valence).	**PhV** **Disp**	**Import of SUVAXYN Respifend** (MA in US) but little used because of complex supply flows (import) and disease that is not very recurrent. 3 requests recorded at the ANMV since 2018. Supply possible directly from Zoétis: in 2021, import by Zoétis, storage and distribution by Serviphar. **Autovaccines**	**minor**
Genital infections of sows	**Off label local administration of injectable or intramammary ATB treatments** for which no adapted dosage regimen is available.	**0 VMP**	**ATB injectables (amoxicillin, colistin, ampicillin) or intramammary (MASTIJET) used locally.** Work in progress at the CSMV on these local uses.	**minor**

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Pathology: currently being resolved with existing solution	Initial problem (as encountered by the sector)	Type of problem	Solution / Alternatives Reason for: Resolution in progress / Disappearance of the therapeutic gap	GAP initially Major: M minor: m
Neonatal diarrhoea due to Clostridium	**Recent vaccines** marketed late (see opposite) **Previous vaccines ± effective** **Major risk with regard to antibiotic resistance** given the high (and orally) consumption of antibiotics for these indications	**PhV**	**Recent authorised and even more recently marketed vaccines:** SUISENG DIFF/A (MA dated 12/2021) launched in spring, ENTEROPORC AC (MA dated 12/2020) launched in spring 2022 and SUISENG COLI/C (MA dated 03/2020). **Antibiotics** (risks - see opposite)	**MAJOR**
Post-partum sows	**Marketing withdrawal of SERGOTONINE** in 2020 by the only supplier. Impact +++: piglet stillbirth and milk losses for sows => economic + subsequent fertility damages, need for ATB in case of problems.	**Disp**	**Import (Spain or Poland) of HEMOGEN (ergometrin alone without serotonin). Very satisfactory recourse.** Several import requests in 2021. **ATU since 07/2022, valid until 07/2023.** Need to reassure practitioners about the continuation of the ATU procedure. Increasing use of this VMP (hyperprolificity issue which increases concerns)	**minor**
Actinobacillus	**Commercial vaccine ± effective => autovaccines spontaneously preferred** 1 single vaccine (PORCILIS ACTINOPORC – Intervet MA dated 1996). Very limited sales. 16 PhV declarations in 2014, no recent declarations. COGLAPIX (Ceva) has a MA in Eu, but not in Fr.	**PhV**	**Autovaccines (common)** 2 requests recorded at the ANMV in 2022, 1 in 2021, 2 in 2020. **Satisfactory ATB treatments** (tetracyclines, sulphonamides) in the event of a clinical emergency.	**minor**
Ileitis	**A single oral vaccine ± effective** (ENTERISOL Ileitis – Boehringer MA dated 2005): rigourous application required (compatibility of drinking water, hygiene) but effective.	**PhV**	**Recent injectable vaccines:** PORCILIS Lawsonia ID (MA dated 12/2020) and PORCILIS lawsonia (MA dated 08/2019) **with satisfactory efficacy.** **Effective** antibiotics (tylosin, tylvalosin, lincomycin, tiamulin)	**MAJOR**
Leptospirosis (sows)	**1 vaccine** marketed by MSD (MA dated 2016): PORCILIS ERY+PARVO+ LEPTO **Available only since 2019.** Diagnosis difficulties. Has led to reduce the use of tetracyclines on sows.		**Vaccine available with good efficacy against leptospirosis**, but according to the sector, more limited against parvovirosis (id other parvo vaccines) - potential risks on the control of leptospirosis if this led to a reduction in the use of this vaccine. For illustrative purposes*, a dozen of declarations of lack of efficacy with a potential causal link have been reported to date to the ANMV for PORCILIS ERY+PARVO+LEPTO, of which half clearly refer to parvovirosis. Antibiotics	**minor**

**the number of declarations recorded by the ANMV is only one element of the surveillance of veterinary medicinal products, which must be correlated with the following information : the date the drug was first marketed, the number of animals that have actually been treated with the drug, the assessment of the causal relationship according to the ABON method between the symptoms or lack of efficacy described and the administration of the drug, the fact that these reports concern animals whose health status may be very variable and/or who received several drugs at the same time, the exhaustiveness of the national database (does not contain reports before 2008 nor all non-serious cases).*

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General remarks:

1. **Risk of disappearance of drug premixes**, due to the divestment of medicated feed and premixes manufacturers, in line with the recommendations of the NVR. The impact may be critical notably for macrolides and betalactamines
2. **Compliance with the SPC according to Art. 106 of the 2019/6 NVR** may be problematic, particularly for old antibiotics with inappropriate dosages, especially as the interpretation seems to be different depending on the European countries.