MANAGING HIGHLY PROLIFIC SOWS

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ABSTRACT

Hyperprolific sows are the main characteristic of French swine breeding herds and has been/is always the object of research and reflection, as well as the object of criticism and controversy (these extreme and opposing positions are voiced even within one country such as France). That the debate is controversial forces us to question ourselves. One way to refrain from doing so would be to reject the question of hyperprolificacy, claiming that it is not part of one's culture and practices. In the face of such criticisms, the best we can do is to attempt to analyze them. In other words, we do not wish to take a stance in the controversy itself; we do not present ourself as the defender of hyperprolificacy. Instead, in this presentation, we wish to look at the terms of the debate and question them. This is what we see: in France and in Denmark, hyperprolificacy is an issue that must be managed on a daily basis. And this issue will spread to all the pig producing countries. Management of hyperprolific sows is specific. To summarize, we can say that, for each individual management measure, there are always two opposite aspects, like in the *"Strange Case of Dr. Jekyll and Mr. Hyde"*. We have the expected 'good' one (Dr. Jekyll) but also the 'bad' unexpected 'side effects' (Mr. Hyde). French producers had to learn 'hyperprolific sows' and … they learned.

INTRODUCTION: HOW TO ANSWER THE QUESTIONS?

The Organizing Committee asked two questions:

- How should we manage the modern highly prolific sow?
- Have we put too much emphasis on maximizing litter size and compromised piglet viability?

The Country Effect and Hyperprolificacy

What is a 'country effect'? It is 'only' a particular feature pertaining to a given country rooted in a specific cultural environment and leading to numerous consequences. In pig production, it may have to do with herd management, with utilization of some diagnostic tools or even with the conviction that some choices are linked to health problems. All 'country effect' features lead to or should be of concern. Undoubtedly, these features certainly have positive components; however they are also a source of constraint or may sometimes generate negative consequences.

The ‘country effect’ should be of interest for producers and vets from abroad who only see the consequences and are not aware of the underlying causes (the ‘roots’).

At the 2008 Banff Seminar, our French colleague and good friend Sylviane Boulot gave a talk on the management of high prolificacy in French herds with this question: Can we alleviate side effects on piglet survival? Her first recommendation regarding specific strategies to be implemented at the farm level is ‘farrowing induction’ (Boulot et al., 2008). Induction of farrowing with prostaglandins is a typical aspect of what I call ‘the country effect’ (Martineau, 2008).

Nonetheless, whether you are for or against induction of farrowing (and you have valid reasons for either), you should know that in most Northern European countries, the use of prostaglandins is prohibited. The case of Denmark is particularly interesting given that its productivity is one of the best in the world. There is no doubt that Denmark is often cited as a model.

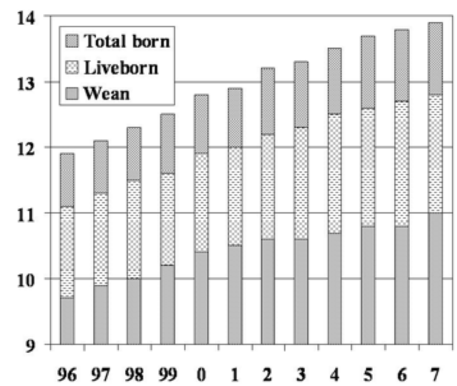
French producers are very large users of prostaglandins in sows, used for inducing farrowing as well as for the control of postpartum vulvar discharge, by injection of PGF2α 36-48 hrs after farrowing. The first rationale for using prostaglandins is to avoid farrowing during the weekend. In France, it is culturally difficult to work or to request employees to work during weekends. The second rationale is to be present during the farrowing process. By contrast, and with the same level of productivity, Danish producers do not use prostaglandins because it is forbidden by law. How do they manage to have such a high level of productivity? How difficult is it?

We are culturally accustomed to using prostaglandins and, more importantly, we do not have serious doubts regarding their relevance. However, some companies are now re-evaluating their recommendation to use prostaglandins after analyzing everything, on the economical point of view, on which it may have an impact. From the Danish perspective, farrowing performances are obtained without the use of prostaglandins or any other means linked with hormonal products. Shouldn’t we ask ourselves the question: are prostaglandins a necessity? Once again, there are many advantages -- the objective of induced farrowing is to allow increased supervision of piglet delivery to improve neonatal survival, minimizing holiday and weekend work, and facilitating cross-fostering. Inducing parturition also allows batch farrowing to be used to reduce the variation in piglet age which has been widely documented in all textbooks. At the same time, the disadvantages - immature piglets and body-weight disadvantage at weaning - are also cited and are also very well-known. Some of the risks associated with early farrowing have been recently discussed by Gunvaldsen et al. (2007). Notwithstanding, there are ways to do a very good job even without these products.

Strategic and Tactical Management Measures

The word ***strategy*** is often confused with tactics. In modern usage, strategy and tactics might refer not only to warfare, but to a variety of business practices, including the pig business. There is no doubt that the 2000 (r)evolution of the sow herd is the strategy of hyperprolificacy which is characteristic of the majority of the genetic lines widely used in France (Figure 1).

Figure 1. Evolution of the prolificacy in France (GTTT: ~2,800 herds, ~1,000,000 litters). Since 1996, there has been an increase of 0.2 total born piglet /year, the same evolution between 1996-2003 and 2003-2007.



In 2006, mean live born of the top third French herds is above 13 live born piglets/litter (Table 1). As the standard deviation is around 3, that means that 2/3 of the litters have between 10 and 16 live born piglets but also that 15% of the litters have over 16 total born piglets.

Table 1. Evolution of the productivity in a 240 sow-herd in the South of France. (Charrier, personal communication, 2007)

	2004	2005	2006
Weaners/Productive Sow/Year	29.84	30.16	30.57
Total born /litter	14.90	15.26	15.32
Born alive / litter	13.60	13.92	14.05
Stillborn / litter	1.30	1.34	1.27
Weaners/litter	12.23	12.31	12.43
% Preweaning mortality on total born	17.91	19.33	18.86
% Preweaning mortality on born alive	10.07	11.56	11.53
Farrowing rate (%)	91.2	92.3	90.6
Interval Weaning-Conception (days)	5.8	5.5	6.2

Essentially, ***strategy*** is the thinking aspect of planning a change, organizing something, or planning a war. Strategy lays out the goals that need to be accomplished and the ideas for achieving those goals. Strategy can be complex multi-layered plans for accomplishing objectives and may give consideration to tactics.

Relative to our subject, an example of a relatively new global strategy for the sow herd is the batch farrowing management system mainly adopted for farrowing sows and piglet management, which is the topic of this presentation.

Tactics are the meat and bread of the strategy. They are the "doing" aspect that follows the planning. ***Tactics*** refer specifically to action. In the strategy phase of a plan, the thinkers decide how to achieve their goals. In other words they think about how people will act, i.e. tactics. They decide on what tactics will be employed to fulfill the strategy.

The tactics themselves are the things that get the job done. Strategies can comprise numerous tactics, with many people involved in attempting to reach an overall goal. While strategy tends to involve the higher-ups of an organization, tactics tend to involve all members of the organization, including pig workers.

Relative to our subject, there are many tactical management measures taking into account the new characteristics of the hyperprolific sow as well as for the supernumerary piglets (cross-fostering), each of them with advantages but also disadvantages and many constraints.

CHARACTERISTICS OF HIGHLY PROLIFIC HERDS

Besides general data, it is important to give an example of what is meant by the term "hyperprolific" with respect to commercial family farms in France (Table 1).

As reported in Table 2, French herd size is small compared to North America (and, in Europe, Denmark and Spain). The first consequence is that such herds are mainly part of a family farm with only one or two employees.

Table 2. Sow performance in France (from the French National Analysis of sow herd, Royer, 2008).

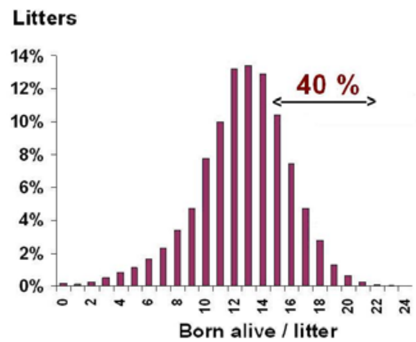
From 01/01/07 to 30/06/07	All herds Mean *(±SE)*	First 33% Mean *(±SE)*
Number of herds	1915	631
Number of sows/herd	180 *(160)*	250 *(210)*
Born alive/Litter	12.8 *(0.9)*	13.2 *(0.6)*
Stillborn/Litter	1.1 *(0.4)*	1.0 *(0.3)*
Weaned/Sow	11.0 *(0.8)*	11.6 *(0.5)*

CHARACTERISTICS OF HIGHLY PROLIFIC SOWS

Beside the positive aspects (increasing of the numeric productivity), we have to take into account the lactating capacities of the hyperprolific sow, the variability of the piglet's weight at birth and also some deviations of the management regarding cross-fostering.

Concerning the number of mammary glands, 40% of litters are over 14 born alive and exceed "normal" teat number (Figure 2).

Figure 2. **Distribution of 1,162,886 litters born in 2005 according to number of born alive (Boulot, 2008, IFIP-GTTT France, personal communication).** 40% of the litters have live born piglets exceeding 14 teats.



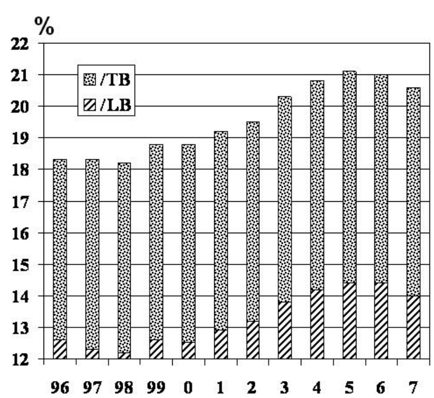
This observation explains why there is an active selection on number of teats (Table 3). Before this increasing capacity of sows (number of teats) will arrive at the production level, producers have to find solutions for these supernumerary piglets to survive.

Table 3. **Evolution between 2002 and 2007 of the % of purebred French sows with <u>16</u> functional teats (Boulot, 2008, personal communication).**

	Year 2002	Year 2007
Large White (LC 110)	9.6%	29.9%
French Landrace (LC 330)	11.8%	34.4%

Beside the evolution of the prolificacy in France (Figure 1), there is also an evolution of preweaning losses (on total born as well as on live born piglets) as reported in Figure 3 which is at the center of a polemic.

Figure 3. **Evolution of preweaning losses French (GTTT: ~2,800 herds, ~1,000,000 litters).** Producers had to learn "hyperprolific sows" and they learned according to the recent decrease of preweaning losses on live born piglets.



Furthermore, the higher number of weaned piglets results in overcrowding in nurseries and finishing rooms, due to the inadequacy between batch size and room capacity. This is because most facilities were designed a few years ago when litter sizes were smaller than currently. Consequently producers have to modify their tactical routine management measures in order to face these overcrowding issues. However, producers always wish to make their herds as profitable as possible and they are aware of the importance of having full batches on profitability and so a compromise needs to be worked out.

Strict observation of all-in, all-out means keeping batches of pigs together from weaning to slaughter. However due to the heterogeneous growth of pigs, it is difficult to stick fully to this principle and producers frequently move poor doing pigs between batches. There are many consequences of such a situation, mainly regarding the dynamics of infection such as PRRS.

For our topic, the major fact is the effect of litter size on the birth weight distribution (Figure 4A) and the importance of small piglets of less of 1 kg BW at birth (Figure 4B). In Figure 4A, we have to mention that there are always >1.8 kg BW piglets even if there are >15 piglets/litter. However, the percentage of piglets <1kg increases when litter size increases (Figure 4B).

For an increased number of total born piglets by 25%, there is an increase of 16% in the weight of the litter. Therefore, it is a mathematical certainty that there is an increased number of small piglets.

Figure 4A. Effect of litter size on the birth weight distribution.

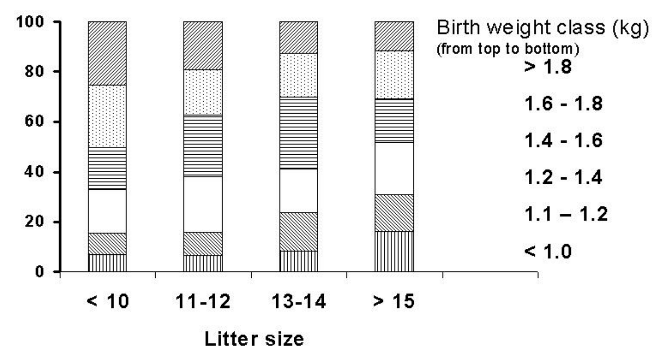
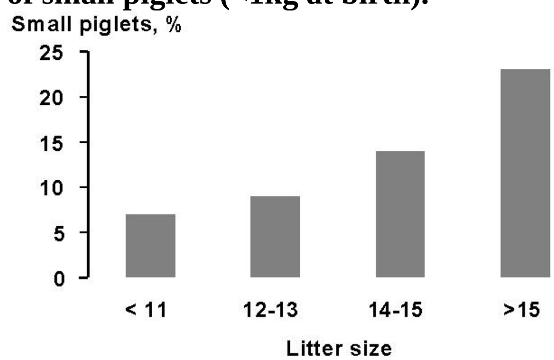


Figure 4B. Effect of litter size on the % of small piglets (<1kg at birth).



As illustrated in Figure 4B, around 20 to 25% of piglets are under 1 kg BW in large litters. There are a lot of questions regarding the evolution of lightweight piglets during growth until market weight but this is beyond the scope of our objective. There is a strong influence of weaning weight on age at slaughter: weaned piglets of 4-4.5 kg BW at 4 weeks reach market weight 28 days after piglets of 10-10.5 kg (Le Treut, personal communication, 2008). However, there are always light piglets in "conventional" (or standard) litters (Table 4).

Table 4. **Distribution of piglets according to birthweight classes and litter size (observations from Experimental swine Station of Romillé from the French Swine Institute (Gourmelen and Le Moan, 2004) (data from 14,000 litters).**

Distribution by classes of weight and litter size	Birth weight (kg) <1.0	1.0-1.2	1.2-1.4	1.4-1.6	1.6-1.8	1.8-2
Total born						
Standard: 13	14.2	13.7	21.6	24.7	15.9	9.9
Hyper : 15	22.0	18.9	22.4	19.9	11.7	5.1
Live born						
Standard: 12	10.1	12.1	19.8	20.6	21.6	15.8
Hyper : 14	12.8	17.2	22.6	22.6	15.5	9.2

After farrowing, pre-weaning deaths (<10-12%) occur within the first 72h post-partum. Piglet birth weight is an important survival factor but we have to modulate it. Indeed, the weight alone is not enough to explain mortality even if it is well known that piglets under 0.8 kg BW are at greater risk of dying than heavier litter mates. Besides weight, we have to take into account maturity and vitality. There are a lot of field investigations regarding immaturity, defined by Foxcroft et al. (2006) as "Intrauterine Growth Retardation" (IUGR). Birthweight is not enough to describe immaturity. We have to add vitality, well described by Herpin et al. (1997), and evaluated by Baxter et al. (2008).

With respect to stillborn mortality, piglet shape and size (birth weight/(crown-rump length)^3) , body mass index (birth weight/(crown-rump length)^2), and farrowing birth order are better indicators. For live-born mortality, postnatal survival factors identified as crucial are birth weight, vigour independent of birth weight, and the latency to first suckle (Baxter et al., 2008).

MANAGING HYPERPROLIFIC SOWS

Feeding Management for Hyperprolific Sows

There are a lot of feeding strategies for feeding gestating as well as lactating modern sows (Bussiere et al., 2008; Vignola, 2009) and I have no authority to give comments and/or criticisms.

For me, with regard to nutrition, two major observations characterize the hyperprolific sow, the lack of early embryonic death with overfeeding after ovulation and, the positive influence of overfeeding during the last weeks of pregnancy.

There is also another characteristic of the modern sow, the lean growth potential and its importance regarding reproduction. It has been well summarized by Foxcroft et al. (2005): *Accepting the risk of being considered somewhat heretical, most of our recent experiments with the lactating and weaned sow lead to the conclusion "that from a fertility and prolificacy perspective, fatness is simply not the key risk factor".* It is why lean tissue mass is of major importance.

In the past, it was generally accepted that increasing dietary intake after ovulation may increase embryo mortality in gilts, related to a variation in the metabolic clearance rate of progesterone. However, analysis of the literature reported by Prunier et al. (1999) gives variable results. In favour: Dyck et al., 1980; Jindal et al., 1996, absence of effect: Dyck, 1991; Dyck et al., 1995; Pharazyn et al., 1991), and the most recent papers are in favour of the absence of effect (Prunier et al., 1999).

The influence of feed allowance during the last 14 days of gestation on farrowing progress and lactating performance has been studied in France in hyperprolific sows by Nathalie Quiniou (2005). In controlled experiments, the highest feed allowance seemed to make farrowing easier and improved neonatal vitality. However, this improved vitality was limited to the neonatal period.

Batch Farrowing

Batch farrowing is an old story in France (early ’70s). It is a management system focused on sow production activities. All sows within the group are at the same stage of production: *theoretically* breeding within three days, *theoretically* farrowing within three days, and weaning on the same day. Some of the resulting benefits of adopting interval batch schemes are in two different fields: zootechnical performances (uniform age and weight at weaning, consistent sow nutrition and phase feeding management, more effective use of all-in, all-out systems) and health performance (disease control, herd stability). There is no doubt that the recent adoption of batch farrowing in North America is linked with disease control, mainly PRRS as well as PCVAD.

The selection of a batching interval is chosen according to the barn objective as well as herd management (such as in France, the employees’ management mainly regarding vacations).

Currently, the most common system in France is the 3-week cycle but decreasing (Figure 5). This 3-week batch farrowing has been implemented in France for 30 years (late ’70s) in very small herds to have enough sows at farrowing to give a revenue for the producer.

There is a clear effect of the herd size on the chosen batch system adopted by the producer (Table 5).

Do we have an impact of the batch farrowing system on performance? A recent study (2007) has been performed in >1,000 commercial herds in Brittany. Results on preweaning performances are reported in Table 6 (Pellois and Badouard, 2009).

The effect of batch farrowing on reproduction has been also evaluated by Larour, 2008 (Table 7). It can be concluded that performance is related to herd size and age at weaning but the impact of batch farrowing is weak.

Figure 5. **Evolution of batch farrowing systems in Brittany from 2000 to 2007 (Pellois and Badouard, 2009).** The 3-week batch farrowing system is still the most common but is decreasing in popularity while new batch farrowing systems (4 and 5 batches) are on the rise.

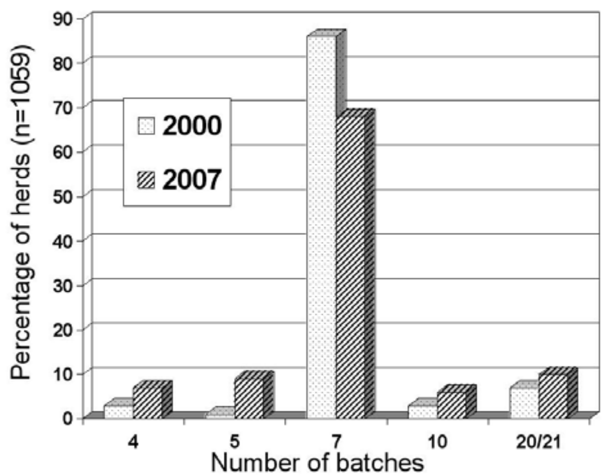


Table 5. **Distribution of herds in Brittany (2007) according to the batch farrowing used (Pellois and Badouard, 2009)**

# batches	4		5	7		10		20	21
Age at weaning (d)	21	28	21	21	28	21	28	21	28
# herds	60	16	99	90	632	49	9	86	18
% of herds	5.7	1.5	9.3	8.5	59.7	4.6	0.9	8.1	1.7
# sow (inventory)	155	141	222	220	176	344	198	616	453

Table 6. **Prolificacy and preweaning performances according to the batch farrowing system used (Pellois and Badouard, 2009).**

# batches	4	5	7		10	20
Age (planned) at weaning	21	21	21	28	21	21
# herds	60	99	90	632	49	86
# sow (inventory)	155	222	220	176	344	615
# weaned piglets/productive sow/year	27.8	27.7	27.6	26.4	29.0	28.9
# live born piglets	12.8	12.7	12.8	12.8	12.9	12.9
# weaned piglets/litter	11.1	11.1	11.0	11.0	11.4	11.4
Preweaning mortality (on live born)	13.4	13.1	13.7	14.5	11.6	11.6
Age (reality) at weaning	20.8	20.8	21.3	27.3	20.6	20.8

Table 7. Reproduction performance according to the batch farrowing system used (Pellois and Badouard, 2009)

# batches	4	5	7		10	20
Age (planned) at weaning	21	21	21	28	21	21
Interval weaning-1st mating	6.5	6.5	6.4	6.5	6.1	6.0
Farrowing rate on 1st mating	90.7	88.2	88.3	87.8	91.5	90.6
Interval weaning and successful mating (d)	9.4	9.6	9.3	9.5	8.1	8.0
Average replacement rate	42.0	40.4	41.8	39.7	39.8	43.1
# litters / culled sows	5.3	5.3	5.3	5.2	5.6	5.4
Interval last weaning-culling (d)	48.2	42.8	41.6	44.1	36.9	34.3

In France, the implementation of this 3-week batch farrowing is in great part linked with the usage of Altrenogest (Regumate® in Europe, Matrix® in North America) to synchronise gilts for breeding. The only physiological parameter that is necessary for its use is that the gilts must be cycling. Although evident and not directly in relation of this presentation, we have to recognize that we have less and less boars in sow herds, a consequence of the general use of AI.

Average replacement rate seems lower in France compared to data presented by Peet (2008) for Canada, USA and UK.

In North America, the majority of batch farrowing systems have adopted the 4-week batch farrowing (in herds of medium size, from 400 to 800 sows) and the 2-week batch farrowing (in herds over 1,000 sows).

Although batch farrowing *theoretically* allows grouped farrowings, we have to take into account the natural variation of the distribution of farrowing in a given batch (Figure 6). Although in batch farrowing systems and with a same day of weaning, there is a "normal" variation according to the day of breeding and the duration of gestation.

Figure 6 demonstrates the difficulty of cross fostering on Day 1 of this week: only one sow farrowed, with 16 live born piglets. It is why producers have to use other management measures such as "split nursing" (Donovan and Dritz, 2000).

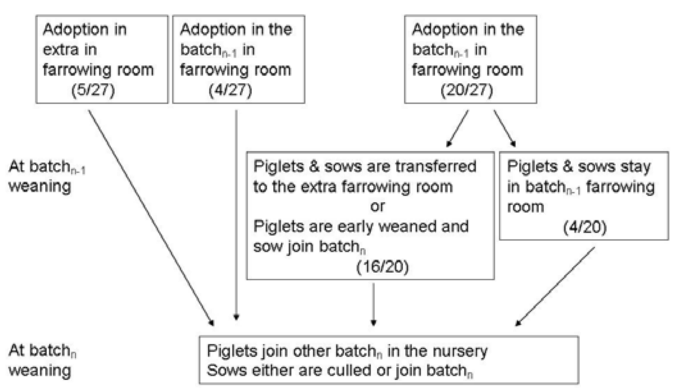
The major consequence of hyperprolificacy is cross-fostering. Although rules have existed for a long time (The "10 principles" developed by Peter English, 1993; Beymon, 1997) and application for piglets of low birth weight management are also well described (Deen and Bilkei, 2004), it is not so easy with hyperprolific sows. In other words, the strategy is well known but tactics vary from herd to herd. In herds with hyperprolificacy, the % of cross-fostered piglets is higher than commonly seen in "normal-prolific" sow herds (Straw et al., 1998).

In a recent survey in 47 herds in France, Hébert (2006) showed that piglets are fostered by a sow from the previous batch whose piglets were early weaned in 27 out of the 47 investigated herds. In this survey, there are different methods of cross fostering (Figure 7).

Figure 6. **Distribution of farrowing in one batch of 17 sows in a 120 sow herd in a 3-week batch farrowing system with hyperprolific sows (born alive for each sow is indicated).** In this herd, prostaglandin (PGF2α) is used only on the Thursday to obtain last farrowings on the Friday (but not during the weekend). However, in this batch, 3 sows farrowed on the weekend). (Gin, 2008, data not published).

Sow	Mo	Tu	We	Th	Fr	Sa	Su
1	16						
2		20					
3		14					
4			18				
5				8			
6				14			
7				16			
8					19		
9					24		
10					16		
11					19		
12					16		
13					15		
14					14		
15						16	
16						15	
17							12

Figure 7. **Example of different modalities of fostering in 27 herds resulted in a high number of tactical management decisions with variable consequences on within-herd animal movements.** This Figure illustrates the different tactics concerning one strategy.



Another recent survey in 34 French herds has been reported (2008) comparing the coherence (between the theory and the practice) of a batch farrowing system and housing, true segregation between different ages and disinfection (Table 8).

A data base of 300 farms using computerized records has been used to examine the extent and timing of cross-fostering being practiced in commercial herds in the Midwestern US and Canada in the mid ’90s (Straw et al., 1998). Authors concluded that farms under use cross-fostering as a management technique. It was in agreement with English et al. (1977) that "few stockpersons exploit it [cross-fostering] as fully as they might usefully do". However, in France, we are often in a situation of 'over usage' of cross-fostering. An example of 'over-cross-fostering syndrome' in a commercial French herd is shown in Figure 8. All piglets have been identified at birth. At 6 days of age, each litter has again been checked.

Table 8. Housing coherence according to the batch farrowing used (n=34 herds in Brittany) (Larour, 2008).

# batches	4	5	7	10	20	Total
Very coherent (100%)	3	3	6	4	6	22/34
Deficient (>95%)	0	3	3	0	0	6/34
Unsatisfactory (<95%)	2	1	1	1	1	6/34

Figure 8. Observational 'over-cross-fostering syndrome' (Too Well Done Job Syndrome) in a herd. At 6 days of age, sow #635 has only 2 of her 13 live born original piglets. On the opposite, sow #638 has all her native ones. Therefore, there are huge variations, mainly according to the day of farrowing (Gin, 2008, data not published).

		Liveborn	PIGLETS' ORIGIN												
			571	636	635	637	638	589	536	523	620	499	573	619	618
LACTATING SOW	571	17	11		2	1									
	636	15		11								2			
	635	13	1	1	2	1		1	4			1	3		
	637	14		1	3	4						2			
	638	13					12								
	589	16				1		10				3			
	536	17			2	1			6				5		
	523	10							5	8					
	620	12	2								12				
	499	17				5		2		1		6			
	573	22			2	2						1	7		
	619	9	3										2	6	2
	618	12												3	10

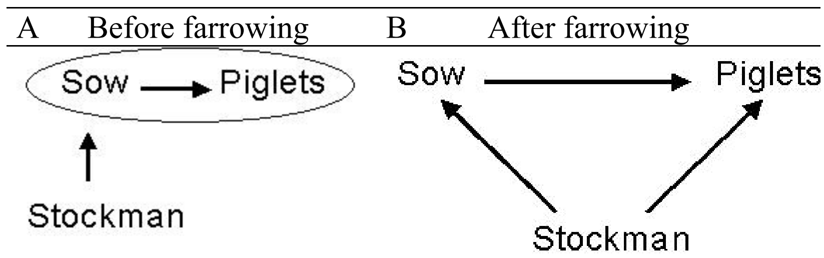
What may be the consequences? This 'over- cross-fostering syndrome' leads to too many manipulations. Even if all these stockmen are well informed of the importance of colostrum, there is some 'drift'.

As a prelude, there is no true 'big' mistake in these sow herds: there are globally good sow and piglet management. However, some measures implemented for apparently good reasons lead to bad results by a counter-intuitive behaviour. These measures lead to more severe problems. To summarize, we can say that, for each individual measure, there are two opposite aspects, like in the *"Strange Case of Dr. Jekyll and Mr. Hyde"*. We have the expected 'good' one (Dr. Jekyll) one but also the 'bad' unexpected 'side effects' (Mr. Hyde).

Induction of Farrowing

There are two phases in the sow and piglets management around farrowing: before (Figure 9A), during and after (Figure 9B) farrowing. Indeed, some tactical management before farrowing (Figure 9A) may have consequences on the piglets' performance. After farrowing (Figure 9B), interaction is much more complex as management rules may be directed to the sow or to the piglets with direct consequences between the sow and their litter as well.

Figure 9. Management according to day of farrowing: before farrowing (left A), sow management has indirect consequences on piglets. After farrowing (right B), management is oriented primarily on the piglets.



Before farrowing, and just to illustrate this duality, the use of a classical management measure: induction of farrowing. Nobody contests the fact that there are many advantages to such a program. However, there are also ‘negative side effects’as reported in a recent experiment (Gunvaldsen et al., 2007). In this study, average gestation length in non-induced and induced sows was 117.0 and 115.1 days, respectively. Beside the effect on growth (for every day of gestation, piglet growth rate increased 26 g per day; therefore, body weights of pigs from induced litters were 576 grams lighter at 16 days of age), there is a risk of higher mortality. The relative risk of morbidity was 2.0 times higher in piglets of induced sows. Therefore, there was a tendency towards higher mortality during lactation in piglets of induced sows and this is why they concluded that an understanding of the objectives of a farrowing induction program and the average gestation length of specific sow subpopulations in herds to avoid production loss associated with premature farrowings was extremely important.

Concerning the gestation length, there is conflicting observations. For many French swine specialists, there is a decrease of gestation length with increasing of litter size. However, results from Spain do not support it (Figure 10). Pedersen and Jensen (2008) reported that gestation length in primiparous sows is shorter than multiparous sows. However, we don’t know if it is a parity effect or a litter size effect because litter size of primiparous sows is lower.

In a recent observational study (Gin et al., 2008), we measured IgG content in colostrum samples from sows and blood samples from 6-day old piglets. There is a strong association between gestation length and IgG concentration in sows as well as in piglets (Figure 11).

Concerning induction of farrowing, one colleague from Quebec asked us the question: “If we cut one day in gestation, will this result in an added day in finishing?” We do not have the answer.

… What About After Weaning …

Although out of the scope of this presentation, we mention the evolution of losses in post-weaning as well as in fattening period (Figure 12).

Figure 10. Gestation length according to litter size at farrowing (4,709 farrowings). D0 of calculation is the day of the first AI (Martinez, Cefusa, Spain, 2008, personal communication). In this sample, more than 56% of the sows have a gestation length of 116 or 117 days

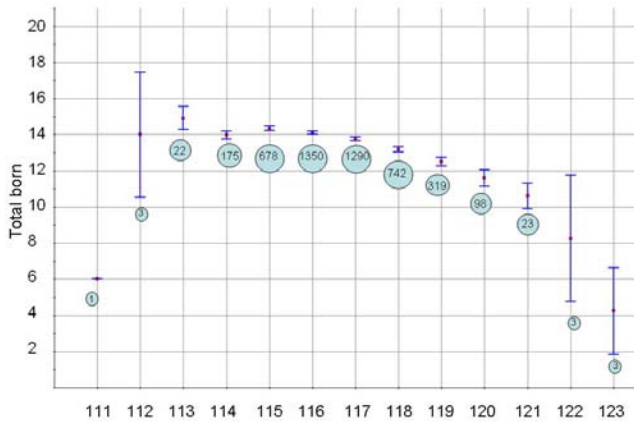
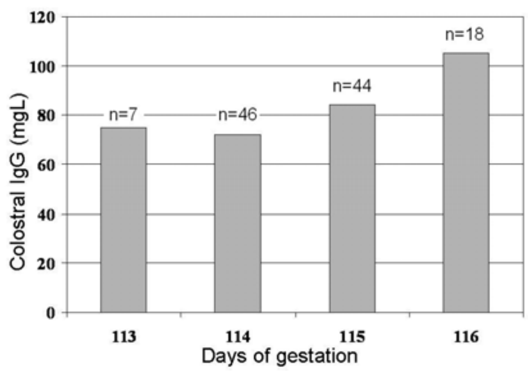


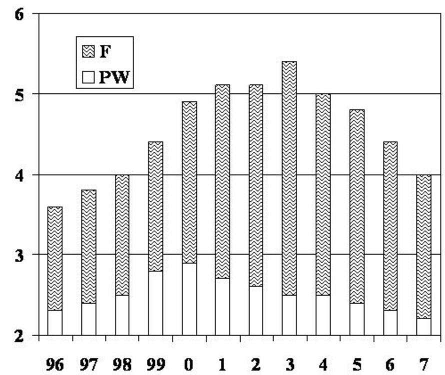
Figure 11. Relationship between gestation length and IgG concentration (mg/L) in colostrum from sows from parities in 10 herds (Gin et al., 2008, data not published).



… What About Economic Impact …

Before we conclude, there is no doubt that there is an economic advantage with hyperprolificacy for pig producers. In 2007, the difference of gross margin on feed cost and replacement is 54 €/inventory sow/year. The economical impact of hyperprolificacy has been studied by Gourmelen and Le Moan (2004). Different scenarios of herd management were compared to an initial situation corresponding to standard (non-hyperprolific) sows. New accommodation investment costs concerning early weaning, post-weaning and fattening stages and labour costs were taken into account. According to the scenario, the difference of gross margin on feed cost and replacement vary from 34 to 126 €/inventory sow/year (Gourmelen and Le Moan, 2004).

Figure 12. Evolution of postweaning (3/4 weeks to 10 weeks of age) and fattening period (to 115kg, including) (GTTT: ~2,800 herds, ~1,000,000 litters). In France, PCAD appeared in 1998. Since 2003, we observe a decrease of the mortality in fattening pigs of about 25% (from 5.5% in 2003 to 4.0% in 2007).



CONCLUSIONS

How should we manage the modern highly prolific sow?
There is not one rule for farrowing sow and piglet management. We have to adapt it according to the country ('country effect') and to the time (some rules written 10 years ago may be now obsolete). Once the strategy is adopted, we have to develop some tactical measures to be able to manage hyperprolificacy. French producers had to learn 'hyperprolific sows' and, at least for the top pig producers, … they learned.

Have we put too much emphasis on maximizing litter size and compromised on piglet viability?
Probably yes and it is probably why, at least in France, we are convinced that we have to stop the race to the number of total born piglets per litter. We have some tools and we have stockmanship. However, for each management implemented measure, we have positive effects (Dr. Jekyll) but also negative effects (Mr. Hyde) and these are less known. These negative aspects are at the origin of many other secondary interventions with many secondary bad consequences.

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