

Teagasc Webinar –
Lets Talk Pigs
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Supplementary milk in the farrowing room



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Outline of presentation

- Why supplementary milk?
- When and how to apply?
- What kind of milk supplement?
- Own research concerning supplementary milk

However, I wish not to talk about:

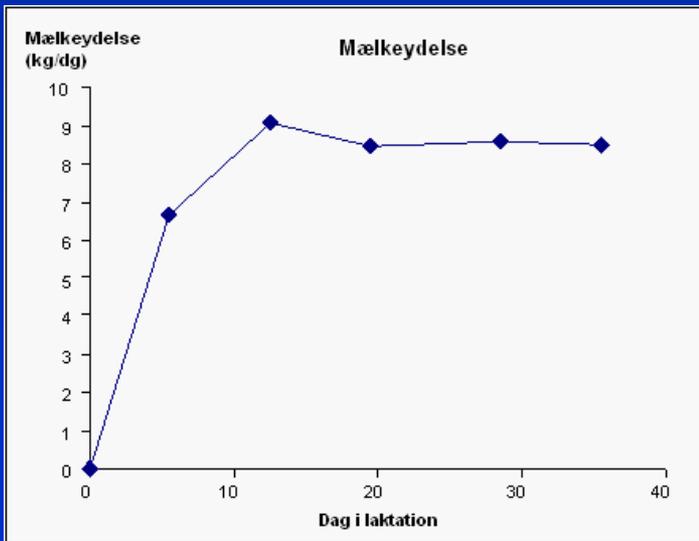
- which supplementary milk equipment to use or
- the economical aspects regarding implementation of the equipment

Why supplementary milk?

- Hyperprolific sows:
 - Increased number of piglets
 - More piglets than functional teats
 - Need for cross-fostering, movement of piglets and use of nursing sows
- Supplementary milk provides the sow the opportunity to foster more of her own piglets.

Why supplementary milk?

- A way to equalize milk quantity
- Diminish sow's negative energy balance during lactation
- Improve sow's reproductive performance



Milk production (kg/day) during lactation
(In: Thorup and Nielsen, 2003 (Meddl. 23b;
mod. after Toner et al., 1996)

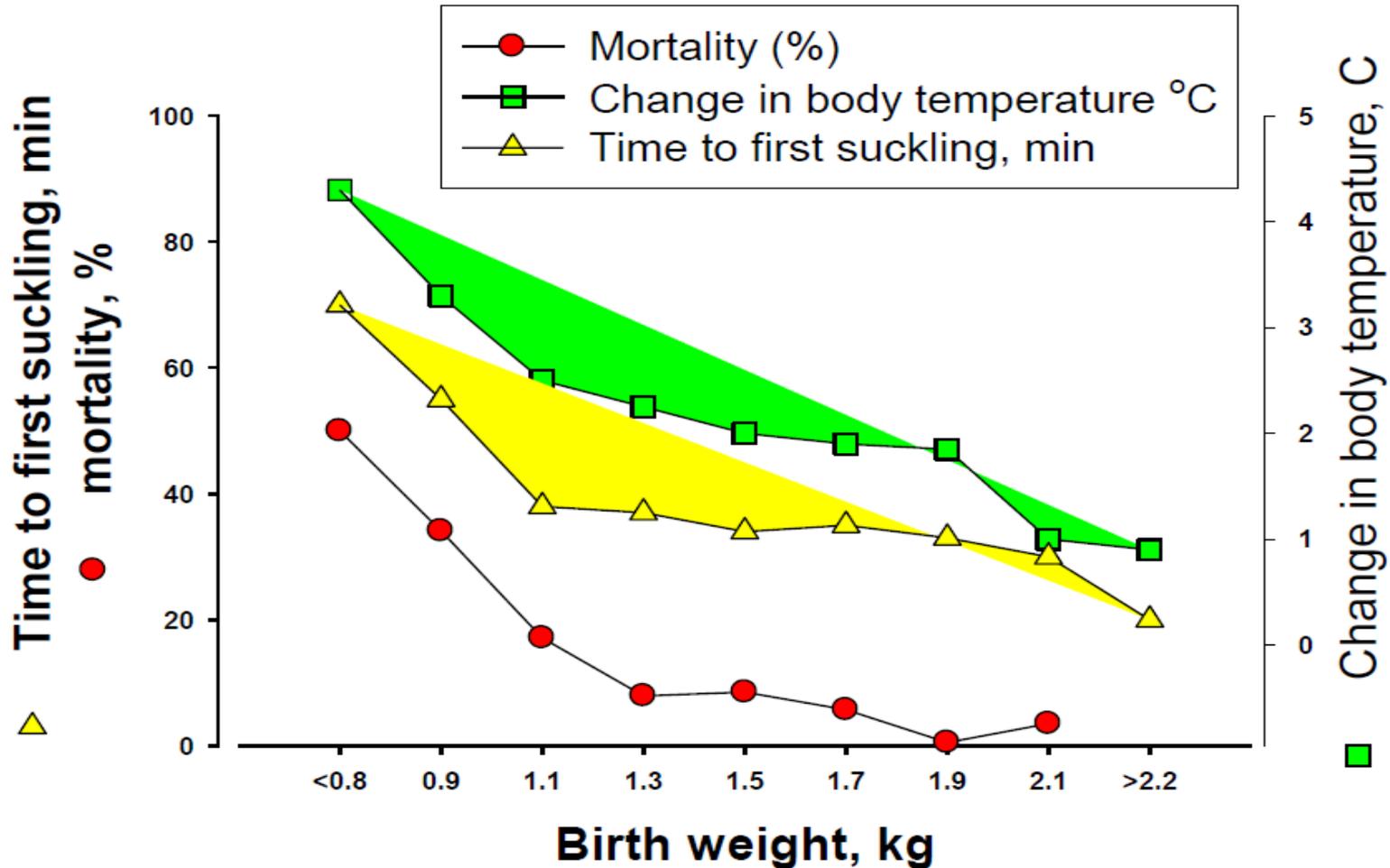
From 2. week of lactation, there is a limitation in piglets' growth below their potential → Early weaning is practised

Why supplementary milk?

- Hyperprolific sows:
 - Challenge with piglet mortality
 - Heterogeneous litters
 - At weaning, less uniformity within litters.
- Supplementary milk can enhance weight gain of piglets during the suckling period, and less piglet mortality will increase number of weaned piglets.

Birthweight and mortality in pigs

Birthweight and mortality in pigs (Hoy & Bauer, 1998)



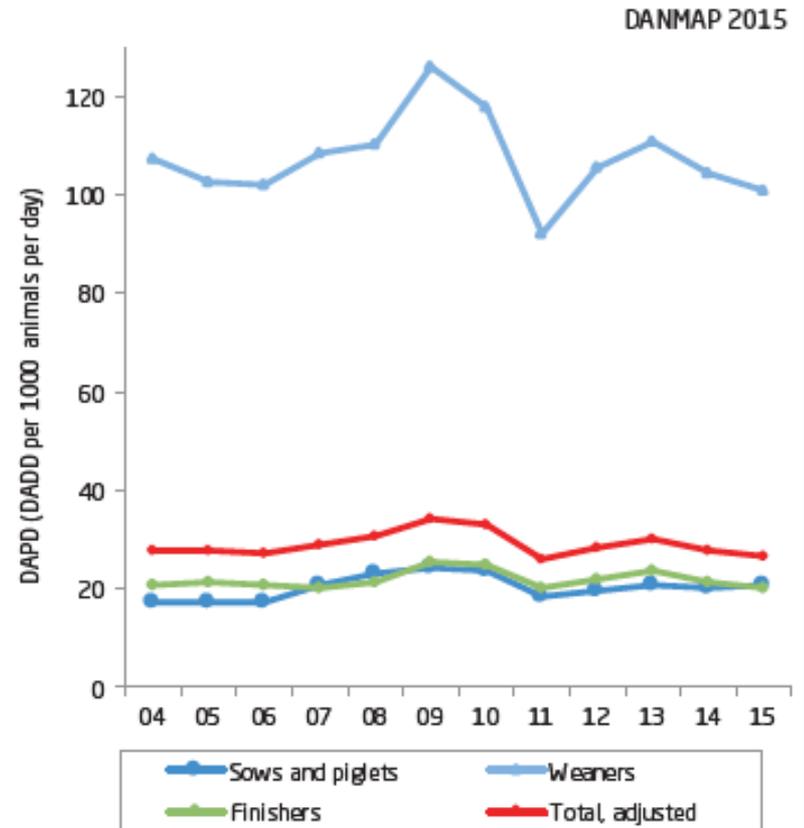
Post weaning diarrhea – a major challenge

Weaners: use of antimicrobials for treatment of gastro-intestinal diseases

- *Increase in veterinary microbials
- *Risk of AMR
- *EU ban on medical zinc from 2022: need for alternatives

Dietary interventions for prevention of post weaning diarrhea may start early!

Figure 4.3. Antimicrobial consumption in the pig production, and the distribution on age groups, Denmark



Reducing piglet mortality

- International experiments showed that at litter sizes of 12, piglet mortality is reduced with up to 4.2% when supplementary milk is provided (Azain et al., 1996; Wolter et al., 2002; Novotni-Dankó et al, 2015)
- Danish study showed marked reduction of piglet mortality at litter size of 14 with use of milk cups (Pedersen and Nielsen, 2017).
- Less piglet mortality \longrightarrow higher number of piglets at weaning

Increased weight gain

- International experiments showed an increased weight gain at weaning of 0.52-1.79 kg/piglet with use of milk supplementation (Azain et al., 1996; Wolter et al., 2002; Novotni-Dankó et al, 2015)
- Danish experiment (use of milk cups) also showed increased weight gain (Pedersen and Nielsen, 2017).



Milk supplementation increased the weaning weight, and probably the robustness of pigs post weaning?

Milk supplements can enhance the sow's capability of fostering more piglets. No movements of piglets among the farrowing units, and hence less spreading of disease and disturbance. Overall: ↓ piglet mortality, ↑ piglet weight gain. Higher the number of piglets → need for milk supplement.

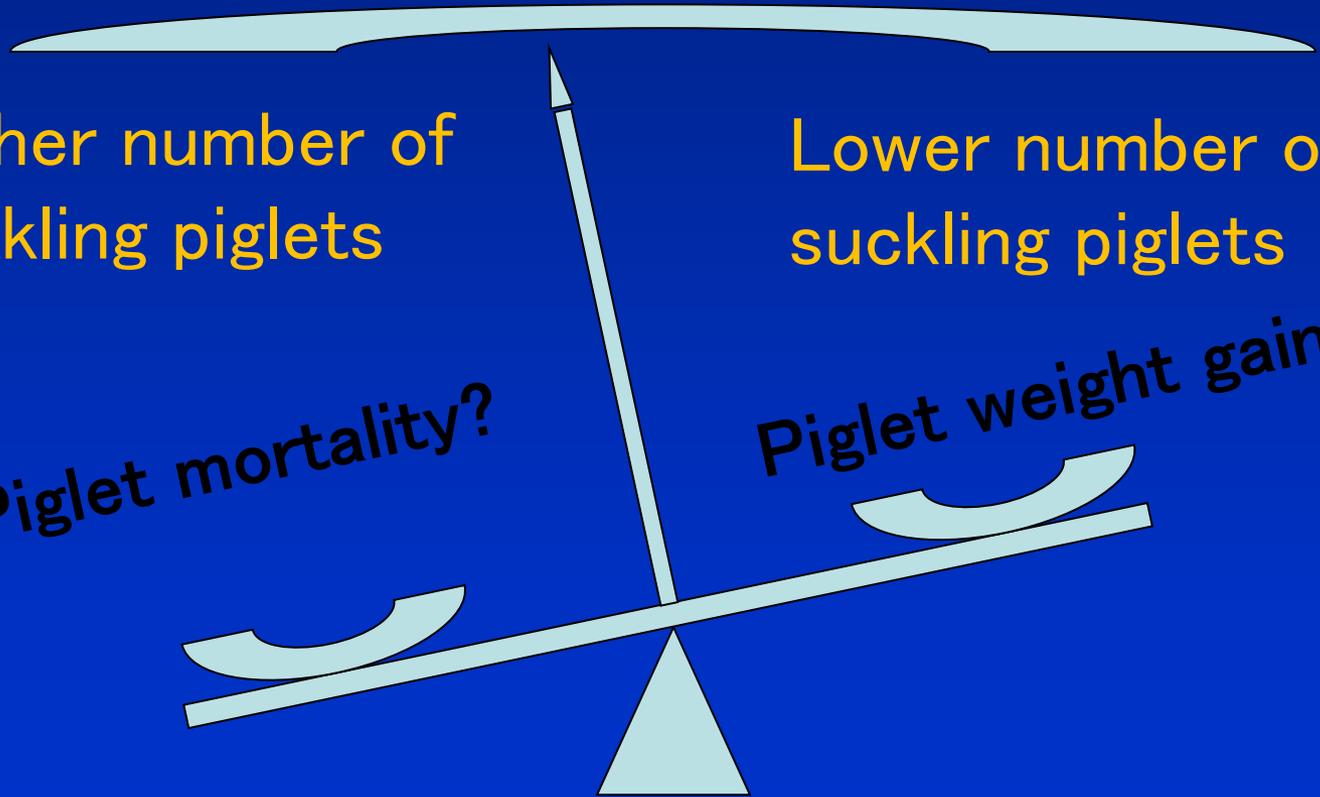
Higher number of suckling piglets

Lower number of suckling piglets

Piglet mortality?

Piglet weight gain?

Importance of milk supplement during suckling



When to apply milk supplement?

- Typically two mixtures are used during the suckling period:

From farrowing and until day 10-14:

Start mix, and thereafter mixture 2 or even mixture 3 until end of suckling period.

Transition depends on milk supplement content and its composition!

What kind of milk supplement? - let's ask the pigs!

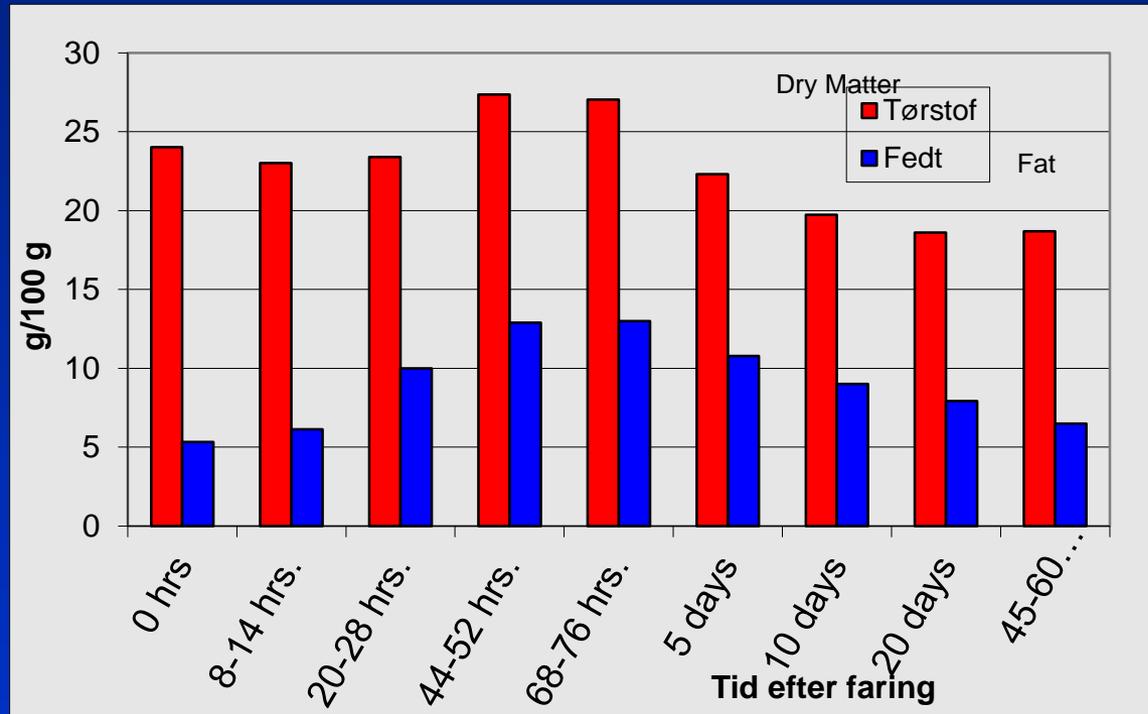
- **The provider (= the sow)**
- Genetic variation
- Physiological variation
- Dietary influences
- Environmental/seasonal influences
- **The recipient (= the piglet)**
- Physiological variation (different nutritional requirements at different developmental stages)
- Individual demands (some piglets may need specific additional supplements for optimal growth and health development)
- High/low birth weight

Is sow milk composition optimized for the large and heterogeneous litters?

What kind of milk supplement?

- Milk supplement cannot replace sow milk or colostrum
- Sow milk composition varies during the lactation.
- As with human, there may be several milk formulars available, which contain macro-micro nutrients (vitamins, trace elements) and bioactive substances (milk oligosaccharides, probiotics....)

Dry matter and fat content in sow colostrum and milk



(Csapo et al, 1996)

-**Apparent fat digestibility** by suckling piglets is very high (96%, Cranwell and Moughan, 1989), so high potential.

Own research: comparison of sow milk, bovine colostrum and milk replacer

Objective

- Characterise gut microbiota
- Age 23-30 days old
- Milk-based diet
 - Bovine colostrum (BC)
 - Milk replacer (MR)
 - Sow milk (SM)



Hypothesis

- BC better substitute than MR
- BC microbial community closer resemblance to SM microbial community



Own research: comparison of sow milk, bovine colostrum and milk replacer

Table 1. Chemical composition of the bovine colostrum (BC), milk replacer (MR) and sow milk

Items	BC*	MR*	Sow milk†
DM (%)	96.1	95.0	17.9
Crude protein (% DM)	71.0	23.3	28.5
Crude fat (% DM)	2.1	13.9	36.3
Ash (% DM)	6.2	7.2	5.6
Ig (% DM)‡			
IgG	38.4	0.05	0.11
IgA	3.59	0.01	2.18
IgM	2.52	ND	0.56

Body weight at 23 and 30 days of age, and diarrhoea incidence rate

Item	Dietary group		
	SM	MR	BC
Body weight day 23 (kg)	8.9	8.1	8.2
Body weight day 30 (kg)	10.2 ^b	9.4 ^a	9.4 ^a
Diarrhoea incidence rate	0.038	0.172	0.054

Ongoing own research on supplementary milk and liquid feed (Born2Gut)

- To study the influence of additional milk supplementation (d 3–12 postpartum) and liquid feeding (d 12 postpartum until weaning) during the suckling period and the effect of two weaning ages (d 24 versus d 35) on piglet growth and performance, immunity and health

What are we looking for?

- The experiment is designed to determine if milk supplementation (d 3–12)/liquid feeding (d 12 until weaning) and weaning age would influence piglets':
- Performance, immunity, and health pre- and post weaning. Further, to study eating behavior (who is eating what and when?)



Perspective: increase in piglets' robustness prior to weaning will reduce the use of ZnO and antibiotics post weaning



Tak-home messages and perspectives

- Supplementary milk replacer can improve weaning weight and reduce piglet mortality
- Can provide the piglet with additional nutrients and additives
- Positive effect on litter homogeneity?
- Effect on gut function, its microbiota and immune responses?
- Strategy to enhance piglet robustness post weaning?