Welcome to the 13th
FeetFirst® Swine Seminar

TOWARDS THE ROBUST PIG
Understanding & Managing Piglet
Birth Weight Variation

ZINPRO®
ADVANCING PERFORMANCE TOGETHER

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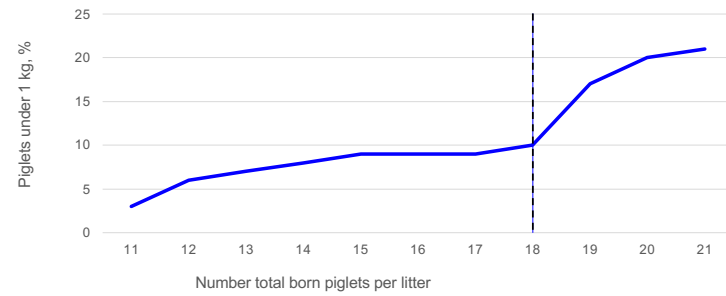
LARGER LITTERS – MORE LOW BIRTH WEIGHT PIGS



F. Thorup, SEGES, 2017

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BIRTH WEIGHT DOES MATTER

- Birth weight: +100 g/piglet
  +3 kg per sow & year
- Wean weight: + 200g/piglet
  +6 kg per sow & year
- Nursery exit weight: +18 kg
- Finisher weight: +42 kg

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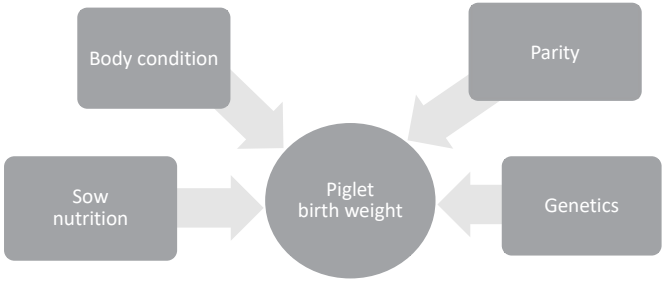
INCREASING PIGLET BIRTH WT – KEY FACTORS



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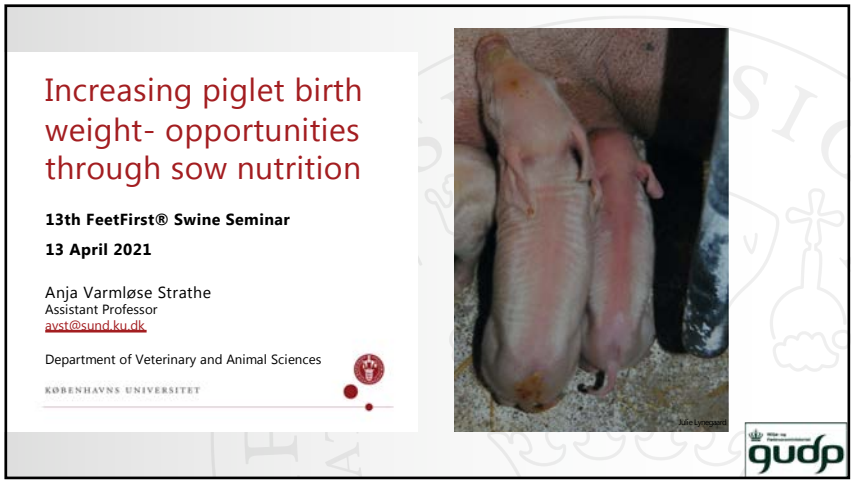

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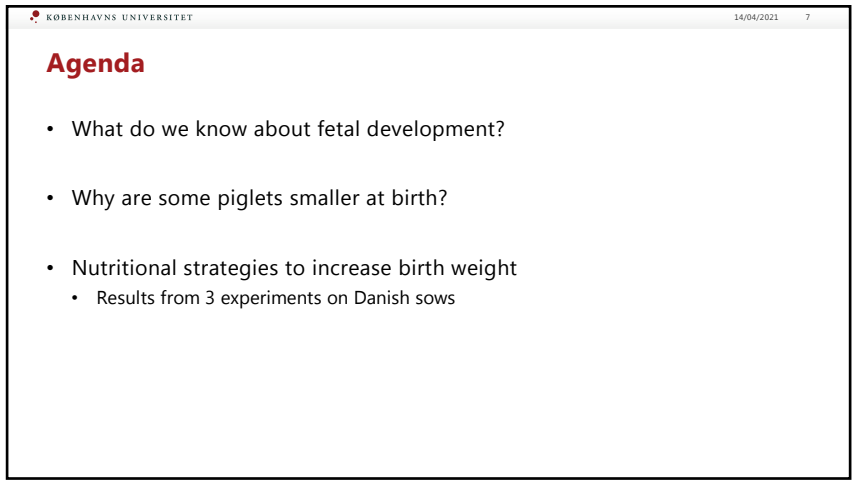

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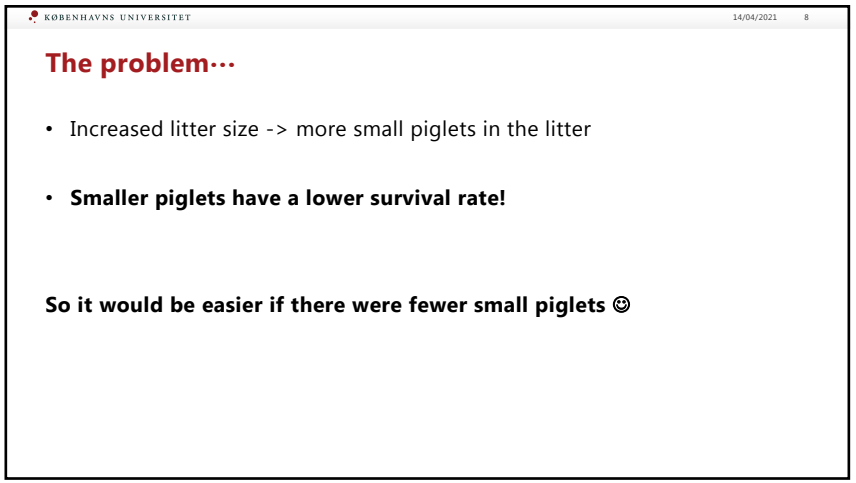

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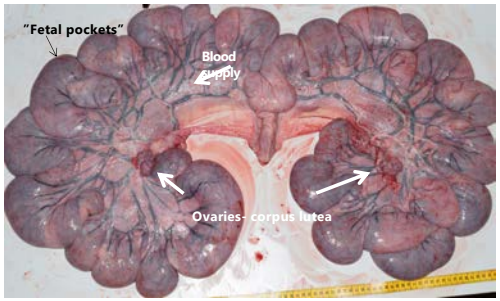
The pregnant uterus



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Fetal development in hyper-prolific sows

- Within-litter variation in fetal weight is already seen at day 28



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Fetal development in hyper-prolific sows

- Smaller fetuses have placentas with lower weight and area


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Why are some piglets smaller at birth???

1) The sow is lacking one or more nutrients

- Eg. Amino acids, fatty acids, vitamins, trace minerals

Examples:
Functional amino acids e.g. arginine and methionine
-> effect on vascularisation and development of placenta.

Fatty acids e.g. omega-3 fatty acids
-> effect on sow immune system, fetal development of nervous system and vision, better cognitive abilities at birth ~higher survival??

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Why are some piglets smaller at birth???

2) Harmful "substances" in the sow have negative impact on fetal development

Examples:

Oxidative stress -> high levels of free radicals and peroxides

-> cell damage and decreases cell signalling

-> negative effect on placental and fetal development

Homocysteine -> negative effect on placental development

-> decreases fetal growth

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The solution…

- Addition of nutrients- fatty acids, amino acids etc.
- Addition of additives that remove the harmful substances
  - Antioxidants e.g. Vitamin C, zinc, selenium etc.
    - Vitamin C and Zinc: superoxide -> Hydrogen peroxide
    - Selenium: Hydrogen peroxide -> Water
  - B-vitamins -> Converts homocysteine into methionine

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Results of 3 feeding experiments in Danish sows

Aims of the studies:

Change feeding in early gestation

1) To decrease the number of small piglets within the litter
2) To increase birth weight of piglets
3) To decrease the within-litter variation in birth weight

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Experimental design

- **Experiments were conducted in two commercial farms**
- **DanBred multiparous sows (Landrace x Yorkshire) inseminated with Duroc semen**
- **The 3 experiments:**
  - **Omega-3 fatty acids**
  - **B-vitamins (B12, B2, Folic acid)**
  - **Antioxidants (Vitamin C, zinc, selenium)**

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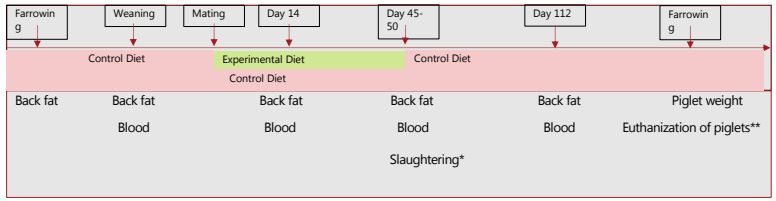
Experimental design- time line of experiments



*No sows were slaughtered in Vitamin B experiment due to covid19
** Piglets were only euthanized in the DHA experiment

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Conclusions

- **We have indications that addition of omega-3 fatty acid and antioxidants in early gestation can increase the birth weight of the smallest piglets in the litter**
- **Antioxidants might increase the size of placenta**

What is next?

- **Finalizing the fourth experiment on methionine**
- **Test the diets on a larger scale**

Overall, there seem to be potential to increase birth weight through nutrition of the gestating sow

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Questions?

The experiments are part of the project Feed4Life (collaboration with SEGES and DLG)

Funded by:

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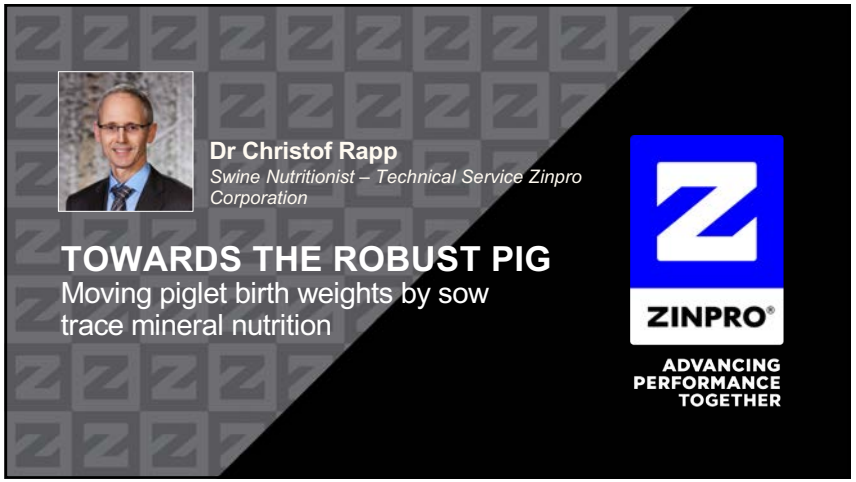

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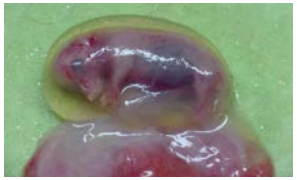
OXIDATIVE STRESS DETRIMENTAL TO EMBRYO

- Oxidative stress has negative effects on
  - Oocyte maturation
  - Embryo development
- Zn, Mn, Cu mitigate oxidative stress through their role as antioxidants (SOD)



Picture source: https://sites.google.com/a/paoli.k12.in.us/phs-animal-sciences/home/gestation

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EXPERIMENTAL DESIGN

- Commercial sow herd in Brazil
- Two dietary treatments
  - Inorganic Minerals – **IM**
  - Partial replacement IM with Availa® Sow – **AvSow**
- Dietary treatment started in lactation and continued until farrowing
- 84 sows and 16 gilts per treatment

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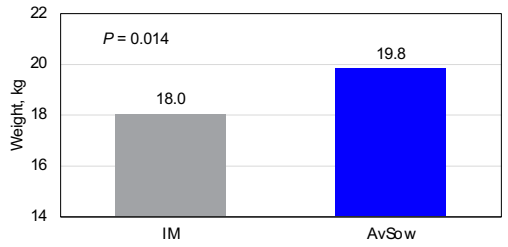
AVAILA® SOW IMPROVED LITTER BIRTH WEIGHT



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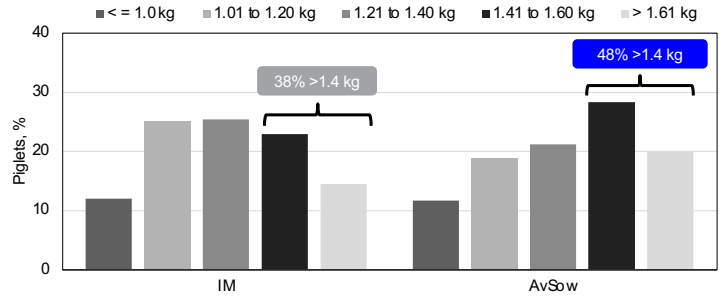
FEWER LIGHT PIGLETS WITH AVAILA® SOW



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BUILD MORE ROBUST PIGLETS WITH AVAILA® SOW

- Add Availa® Sow To Gestating And Lactating Sow & Gilt Diets
  - 50/20/10 ppm Zn/Mn/Cu
  - Heavier piglets at birth
  - More robust piglets

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Thank You For Attending

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