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Individual feed intake during lactation as a trait to improve animal welfare

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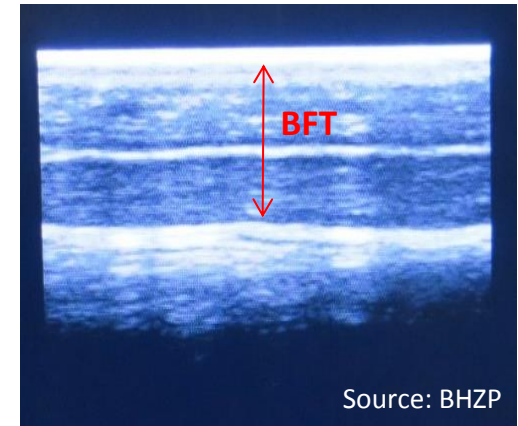


Biggest challenges during lactation:

- Litter size, number of teats and litter homogeneity = important selection traits
- Litter size and litter weight at weaning ↑
- Higher energy demand of lactating sows → feed intake has not increased equally → losses in backfat and body weight of sows increase (Eissen et al., 2000, 2003; Kruse et al., 2011)

Negative effects on animal health, wellbeing and performance

- Recording of individual feed intake of sows during lactation
- Recording of body condition of sows based on different traits:
 - Body weight (BW)
 - Backfat thickness (BFT)
 - Body Condition Score (BCS)



Relationship between feed intake and traits of body condition of lactating sows → animal welfare

Material and methods



- Nucleus farm BHZP GmbH Germany
- October 2016 until March 2018 (N=24 batches)
- Purebred landrace db.01 sows, kept in single free-movement pens
 - 905 litters
 - 562 sows (repeated)
 - 32 - 40 sows/batch
- Duration of lactation: ca. 4 weeks

Project „FreeSow“



Source: BHZP

Material and methods



- **Parity-groups (pg) of sows:**
 - pg1 (parity 1): 350 litters
 - pg2 (parity 2): 248 litters
 - pg3 (parity ≥ 3): 307 litters
- **Feeding of sows:**
 - automatic feeding system (Spotmix, Schauer Agrotronic GmbH)
 - according to good BHZP- farm management practices
 - monday after farrowing: 3 times/day, 13.4 MJ ME/kg feed

Material and methods



- **Recording of individual feed intake FI (kg/day/sow) and energy intake EI (MJ ME/day/sow)**
 - automatically via feeding system
 - correction of FI with FI-protocol/sow
- **Traits of body condition of sows (12-36h p.p.; at weaning)**
 - BW (kg)
 - BFT (mm): P2-Position-7 cm away from body midline at the last rib level
 - BCS: 1-emaciated, 2-thin, 3-optimal, 4-slightly overweight, 5-overweight
 - losses of BW, BFT, BCS
- **Statistical analysis : 9.4 SAS**



- **Individual Feed and Energy intake of lactating sows by parity-group (*mean \pm SD*)**

Trait	pg1	pg2	pg3
FI (kg/day/sow)	4.6 ^a \pm 0.4	5.4 ^b \pm 0.5	5.3 ^b \pm 0.5
EI (MJ ME/day/sow)	61.4 ^a \pm 5.8	71.9 ^b \pm 7.2	70.9 ^b \pm 6.9

a:b-p<0.05

- **Other studies:**
 - Factors: genetics, feeding system, housing etc. (Eissen, 2000; Yoder et al., 2013)
 - 5.9 kg/day/sow (Kruse et al., 2011); 6.9 kg/day/sow (Kecman, 2016)
 - 4.2 kg milk for 1 kg litter weight gain (Kecman, 2016)

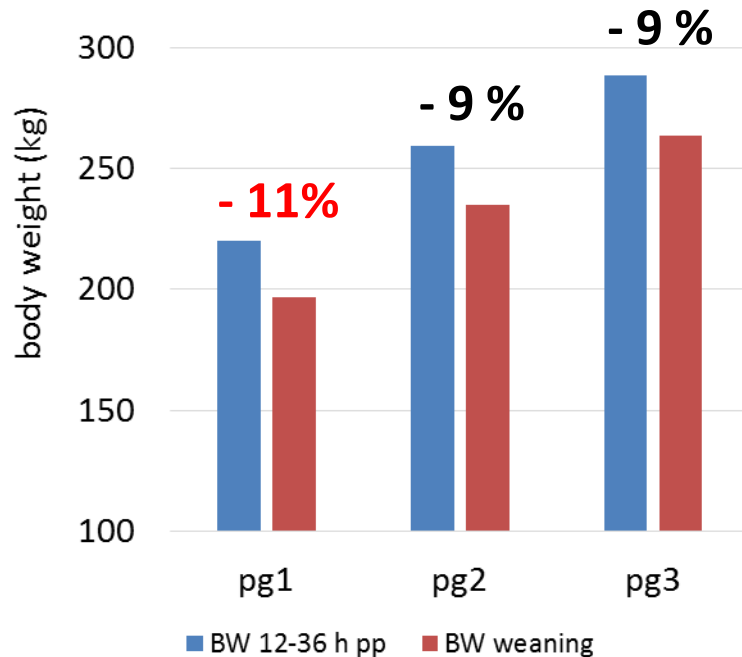
Traits of body condition of sows by parity-group (*mean ± SD*)

Traits	pg1	pg2	pg3
BW 12-36h p.p., kg	219.8 ^a ± 15.2	259.3 ^b ± 18.0	288.3 ^c ± 23.89
BW at weaning, kg	196.5 ^a ± 16.9	235.1 ^b ± 20.3	263.6 ^c ± 25.5
Weight loss, kg	23.4 ± 11.6	24.2 ± 12.2	24.8 ± 12.9
BFT 12-36h p.p., mm	17.3 ± 3.0	17.7 ± 3.9	17.9 ± 4.5
BFT at weaning, mm	14.7 ± 3.3	15.2 ± 3.9	15.3 ± 4.5
BCS 12-36h p.p.	3.5 ± 0.6	3.1 ± 0.7	3.1 ± 0.8
BCS at weaning	2.6 ± 0.6	2.6 ± 0.7	2.7 ± 0.7

a:b:c-p<0.05

Results and Discussion

BW-loss (in %):



BFT-loss (in mm)

parity groups	BFT loss (mm)	BFT (mm) at weaning
pg1	-2.6 ± 1.6	14.7 ± 3.3
pg2	-2.5 ± 1.9	15.2 ± 3.9
pg3	-2.5 ± 1.7	15.3 ± 4.5

Other studies:

- 10 % BW-loss pg1 → negative effect on productivity → smaller second litter size (Thaker and Bilkei, 2005; Schenkel et al., 2010)
- High BW-loss → negative effect on health and welfare



Correlations between daily FI and traits of body condition of sows

Traits	BW-loss	Loss in BCS	Loss in BFT
Daily FI (Daily EI)	0.22 (<.0001)	0.21 (<.0001)	0.14 (<.0001)
BW-loss		0.34 (<.0001)	0.33 (<.0001)
Loss in BCS			0.21 (<.0001)

Other studies:

- BW-loss : Loss in BFT: $r_p=0,494$ (Kecman, 2016)

Conclusions and Outlook



- Feed/energy intake correlated with traits of body condition
- Traits of body condition → indicators for animal welfare
- FI needs to be improved (breeding program) → + effect on body condition and animal welfare
 - Especially 1st parity sows need special attention
- **Outlook:**
 - Emphasis on free movement farrowing systems
 - Relationship between FI, traits of body condition, traits of litter and rearing performance → estimation of variance components → breeding program



Thank you for your attention!



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