

# FARRINGENS BETYDNING FOR GRISEN

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Master thesis in Agrobiolology

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Speciale → Faringens betydning for grisen

Internship → "Lifesocks" om at rede de mindstefødte

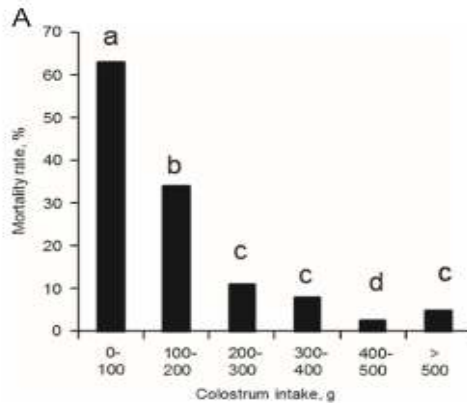
Lige nu → Igangværende forsøg, soens farring

# RÅMÆLK AFGØRENDE FOR OVERLEVELSE

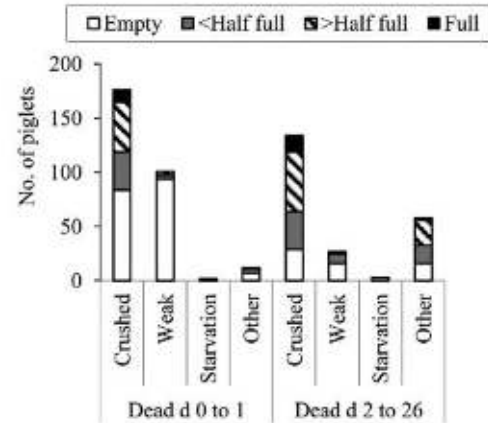
Størstedelen dør inden 3 dage

- 78.5 % of pre-weaning mortality (Rootwelt et al., 2013)
- 51 % of pre-weaning mortality (Le Dividich et al., 2017)

Årsager: Lav fødselsvægt og for lidt råmælk



Quesnel et al. (2012).



Hales et al. (2013).

# VITALITET

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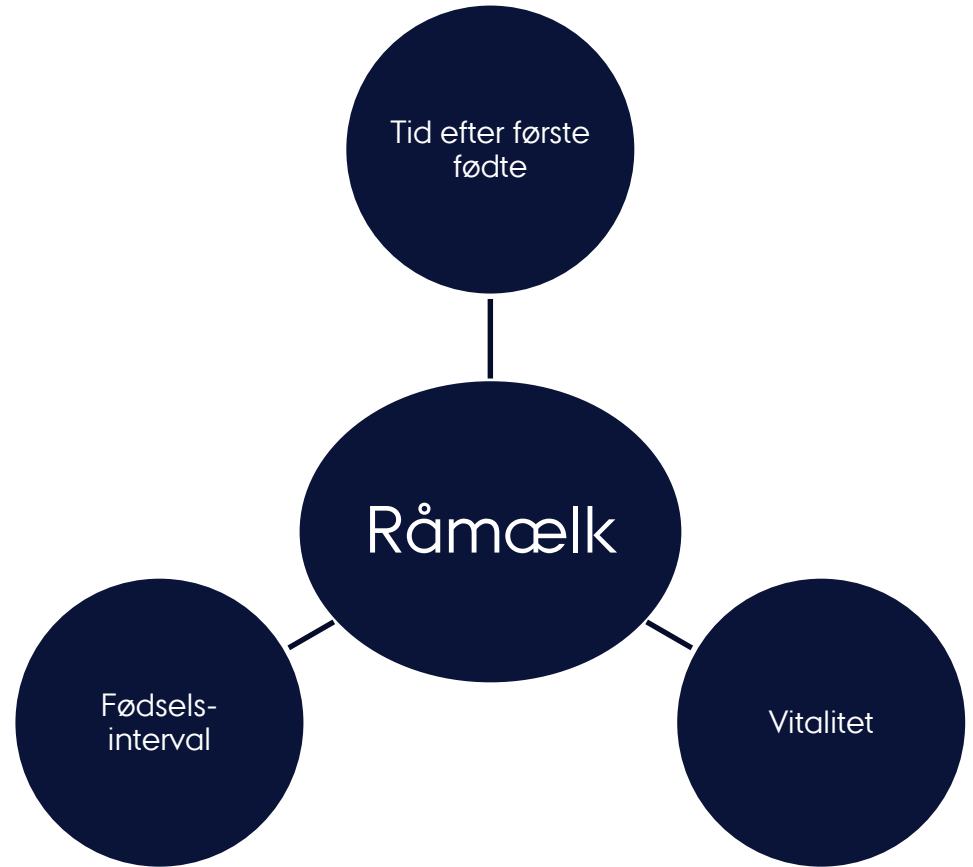
Lav vitalitet

→ Større dødelighed (Baxter et al., 2008)

→ Lider af iltmangel: 15-20 % (Herpin et al., 1996 ; Langendijk and Plush., 2019)

# FORMÅL

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# EKSPLORATIVT STUDIE

Data fra 9 uafhængige forsøg

Vitality score exp. 3+9 (835)

Blodprøver exp. 9 (515)

Table B-1. Description of the criteria related to vitality score 0, 1, 2 and 3 from Baxter et al. (2008).

| Score | Description of the criteria  |
|-------|--|
| 0     | No movement, no breathing after 15 seconds   |
| 1     | No movement after 15 seconds but the piglet is breathing or attempting to breathe (coughing, spluttering, clearing its lungs). |
| 2     | Piglet shows some movement within 15 seconds, breathing or attempting to breathe.  |
| 3     | Good movement, good breathing, attempts to stand within 15 seconds.  |

|                  | Exp.   |         |         |               |        |        |         |         |        | Average |
|------------------|--------|---------|---------|---------------|--------|--------|---------|---------|--------|---------|
|                  | 1      | 2       | 3       | 4             | 5      | 6      | 7       | 8       | 9      |         |
| Born/litter      |        |         |         |               |        |        |         |         |        |         |
| Mean             | 15.6   | 17.4    | 19.0    | 19.0          | 18.5   | 16.2   | 18.3    | 20.1    | 20.1   | 18      |
| ±sd.             | ±3.6   | ±4.1    | ±3.8    | ±2.7          | ±5.0   | ±4.4   | ±3.1    | ±3.4    | ±4.6   | ±4.5    |
| [min-max]        | [4-21] | [11-23] | [11-27] | [14-26]       | [5-27] | [3-23] | [14-23] | [13-24] | [5-29] | [3-29]  |
| Stillborn/litter |        |         |         |               |        |        |         |         |        |         |
| Mean             | 1.03   | 0.50    | 1.54    | 2.30          | 1.43   | 0.86   | 1.67    | 1.44    | 1.23   | 1.30    |
| [min-max]        | [0-10] | [0-2]   | [0-8]   | [0-10]        | [0-9]  | [0-3]  | [0-6]   | [0-6]   | [0-8]  | [0-10]  |
| Total born, n    | 979    | 139     | 703     | 438           | 786    | 470    | 191     | 181     | 1931   | 5818    |
| Sows, n          | 62     | 8       | 37      | 23            | 40     | 29     | 9       | 9       | 96     | 313     |
| Year             | 2007   | 2010    | 2012    | 2013/<br>2014 | 2014   | 2015   | 2016    | 2018    | 2019   | -       |

# METODE

Pattegrise vejet efter fødsel og 24 timer efter første fødte

Råmælksindtag regnet baseret på vægtøgning, fødselsvægt og tid fra onset til fødsel (Theil et al., 2014)

Blodprøve på grisen maks 2 min fra fødsel -> blodgas

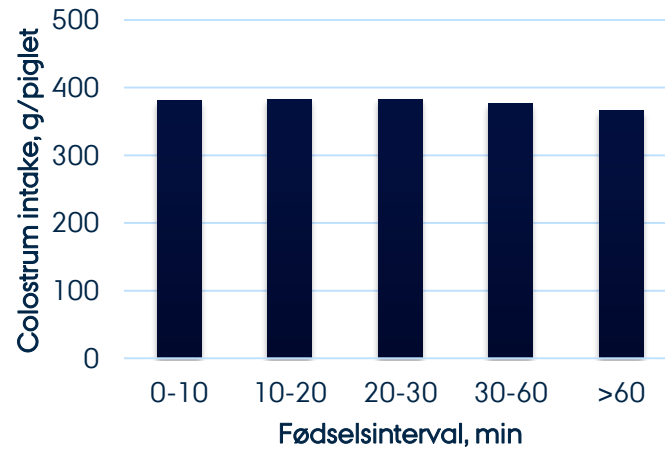
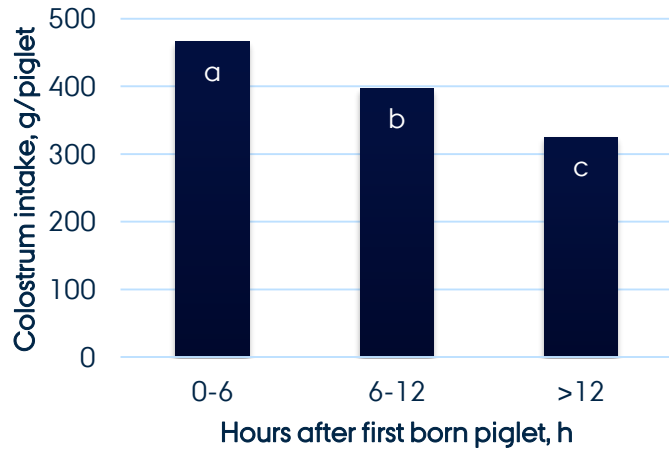
Data analyseret i SAS 9.4

| SB-37           |     | Time relative to farrowing, h |       |              |                                      |                  |                                      |                  |             |                                      |                  |             |   |                               |                 |             |                    |
|-----------------|-----|-------------------------------|-------|--------------|--------------------------------------|------------------|--------------------------------------|------------------|-------------|--------------------------------------|------------------|-------------|---|-------------------------------|-----------------|-------------|--------------------|
| Sow/pigs        |     | Farrowing                     |       | Pigs         |                                      | Sow              |                                      | Sow              |             | Pigs                                 |                  | Pigs        |   | Pigs                          |                 | Dry retain  |                    |
|                 |     |                               |       | Birth weight | Time of farrowing<br>Midpoint sample | Colostrum sample | Time of farrowing<br>Midpoint sample | Colostrum sample | Live Weight | Time of farrowing<br>Midpoint sample | Colostrum sample | Live weight | Litter can be<br>separated, mark<br>1-2 | Time from first<br>separation | Midpoint sample | Live weight | Live weight at 24h |
| Responsibility: |     | MOL                           | MOL   | MOL          | MOL                                  | MOL              | MOL                                  | MOL              | MOL         | MOL                                  | MOL              | MOL         | SR                                      | MOL                           | MOL             | MOL         |                    |
| Sow.no.         | Pen | Date                          | Time  | 0h           | 0.5h                                 | 1h               | 1.5h                                 | 2h               | 2.5h        | 3h                                   | 3.5h             | 4h          | 4.5h                                    | 5h                            | 6h              | 7h          | 8h                 |
| 3019            | 19  | 8/10                          | 17:42 | X            | 13.05                                | 11.11            | 22.25                                | 5.12             | 0.51        | 12.52                                | 14.02            | 12.02       |   |                               | 12.02           | 12.02       | 12.02              |
| 3121            | 23  | 8/10                          | 18:44 | X            | 19.15                                | 19.09            | 20.45                                | 8.12             | 0.51        | 16.12                                | 17.12            | 15.12       |   |                               | 15.12           | 15.12       | 15.12              |
| 3125            | 21  | 8/10                          | 01:42 | X            | 21.02                                | 20.52            | 22.12                                | 10.12            | 0.51        | 18.12                                | 19.12            | 17.12       |   |                               | 17.12           | 17.12       | 17.12              |
| 3150            | 78  | 8/10                          | 06:50 | X            | 17.25                                | 17.11            | 18.12                                | 10.12            | 0.51        | 16.12                                | 17.12            | 15.12       |   |                               | 15.12           | 15.12       | 15.12              |
| 3142            | 21  | 8/10                          | 04:41 | X            | 18.50                                | 18.25            | 19.42                                | 11.12            | 0.51        | 17.12                                | 18.12            | 16.12       |   |                               | 16.12           | 16.12       | 16.12              |
| 3104            | 73  | 8/10                          | 7:30  | X            | 18.20                                | 18.12            | 19.12                                | 10.12            | 0.51        | 17.12                                | 18.12            | 16.12       |   |                               | 16.12           | 16.12       | 16.12              |
| 3126            | 22  | 8/10                          | 17:15 | X            | 18.20                                | 18.12            | 19.12                                | 10.12            | 0.51        | 17.12                                | 18.12            | 16.12       |   |                               | 16.12           | 16.12       | 16.12              |
| 3149            | 23  | 8/10                          | 22:20 | X            | 22.40                                |                  |                                      | 10.12            | 0.51        | 17.12                                | 18.12            | 16.12       |   |                               | 16.12           | 16.12       | 16.12              |



# RÅMÆLK

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# VITALITET

|                     | Vitality           |                    |                    |                    | St. error | P-values |
|---------------------|--------------------|--------------------|--------------------|--------------------|-----------|----------|
|                     | 0                  | 1                  | 2                  | 3                  |           |          |
| Colostrum intake, g | 377.0 <sup>c</sup> | 455.8 <sup>b</sup> | 479.4 <sup>a</sup> | 482.0 <sup>a</sup> | 74.39     | <0.0001  |
| Birth interval, min | 2.21 <sup>ab</sup> | 2.62 <sup>ab</sup> | 2.63 <sup>b</sup>  | 2.23 <sup>a</sup>  |           | 0.0457   |
| LCL:UCL, min        | [1.26:66.0]        | [1.90:99.5]        | [1.92:100]         | [1.28:67.4]        |           |          |
| Weaning weight, g   | 4859               | 5205               | 5465               | 5855               | 1371      | 0.1698   |

Letters denote the statistical significant difference between groups (P<0.05).

# METABOLITTER

Ingen sammenhæng med vitalitet

|                      | Vitality |      |      |      | St. error | P-values    |
|----------------------|----------|------|------|------|-----------|-------------|
|                      | 0        | 1    | 2    | 3    |           |             |
| Glucose mmol/L       | ND*      | 2.37 | 2.40 | 2.37 | 0.20      | <b>0.97</b> |
| Lactate, mmol/L      | ND*      | 4.78 | 4.72 | 4.80 | 0.56      | <b>0.98</b> |
| Oxygen, mmHg         | ND*      | 21.7 | 23.5 | 23.8 | 1.38      | <b>0.42</b> |
| Carbon dioxide, mmHg | ND*      | 55.7 | 57.9 | 58.6 | 2.22      | <b>0.48</b> |

\*Not determined (ND) because of no data for vitality score 0.

# METABOLITTER

Glucose, laktat og oxygen falder med stigende BI

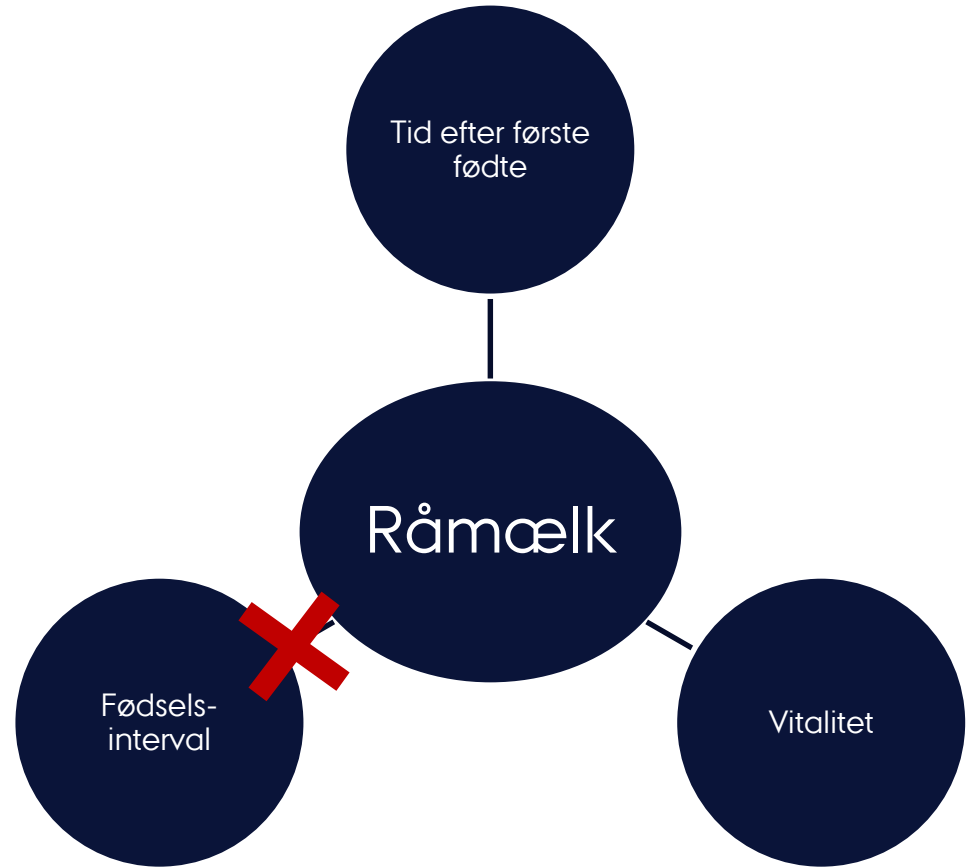
Svækket blodforsyning

Laktat må være et udtryk for niveauet hos soen -> tyder på soen er gået i stå når BI er stor

|                      | Intercept | St. error | P-values | BI <sup>a</sup> | St. error | P-values |
|----------------------|-----------|-----------|----------|-----------------|-----------|----------|
| Glucose, mmol/L      | 2.49      | 0.11      | <0.0001  | -0.36           | 0.003     | 0.04     |
| Lactate, mmol/L      | 5.08      | 0.26      | <0.0001  | -1.03           | 0.009     | 0.06     |
| Oxygen, mmHg         | 24.3      | 0.65      | <0.0001  | -2.78           | 0.022     | 0.04     |
| Carbon dioxide, mmHg | 57.8      | 1.30      | <0.0001  | +0.78           | 0.034     | 0.70     |

\*Not determined (ND) because of no data for vitality score 0.

# KONKLUSION



# KONKLUSION

Fødselsvægt ( $P < 0.001$ )

Råmælksindtag ( $P < 0.001$ )

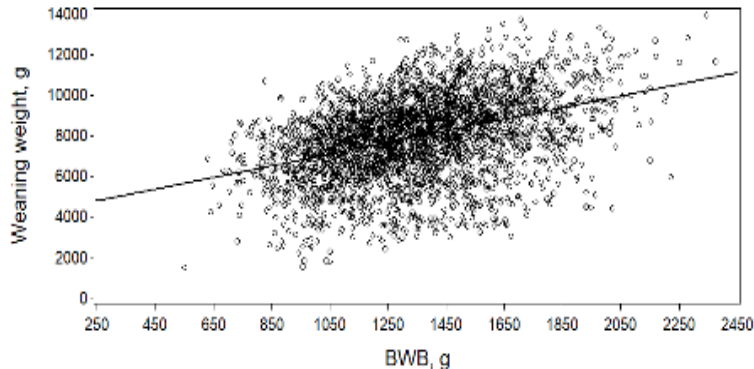


Figure II 5. The relation between body weight at birth (BWB) and weaning weight with the regression line (solid line)  $y = 4073 + 2.873x$ ,  $P < 0.001$

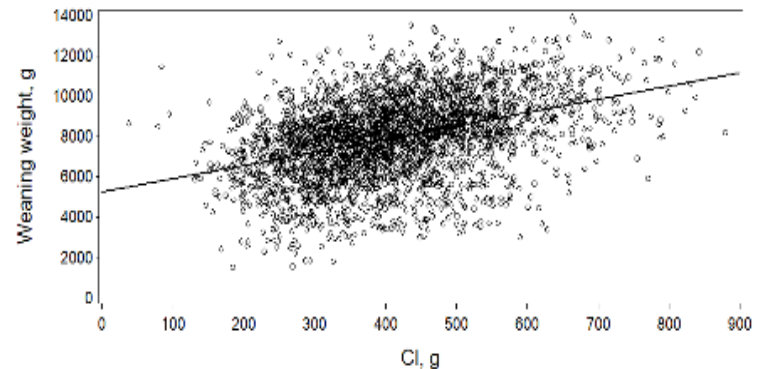


Figure II 6. The relation between colostrum intake (CI) and weaning weight with the regression line (solid line)  $y = 5263 + 6.550x$ ,  $P < 0.001$

# LIFE SOCKS

## Temperaturdrop

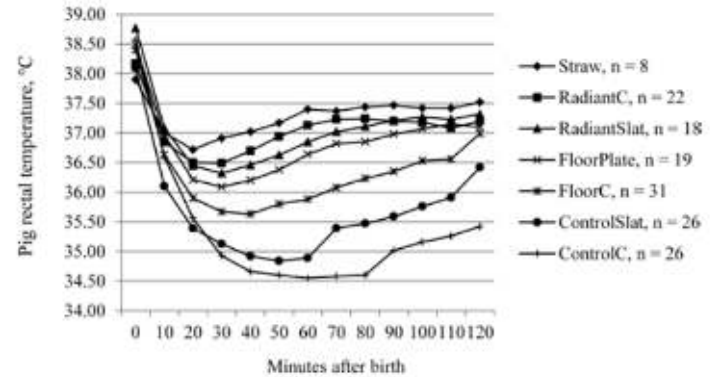
- Direkte årsag til død, indirekte lagt ihjel og sult

## Glycogene depot til 16 timer

- Afhængig af kropsvægt
- Lav vægt → større energibehov pr kg

## Mindste grise i størst risiko

- → Intership **Lifesock**



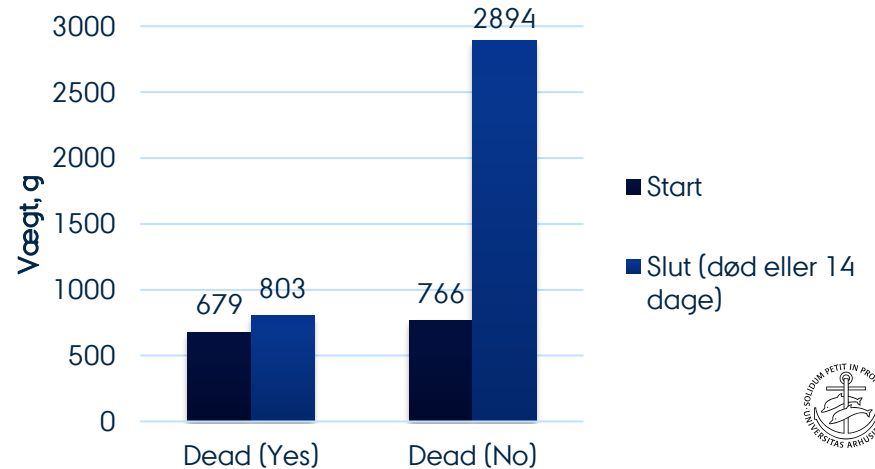
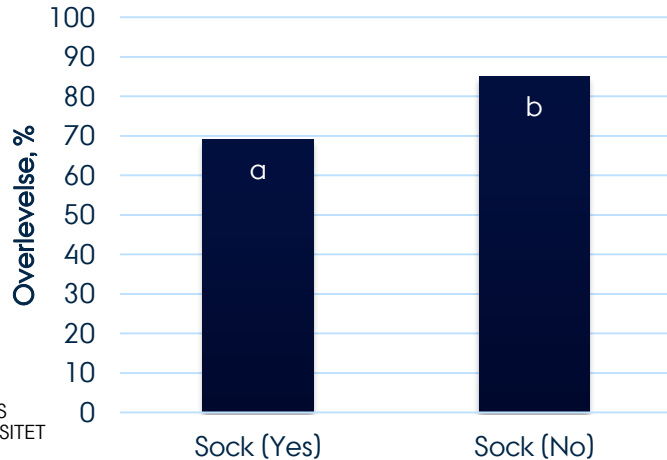
*Pedersen et al., 2016*

| Birth weight | Mortality | Birth weight | Mortality |                            |
|--------------|-----------|--------------|-----------|----------------------------|
| < 800 g      | 68 %      | > 2 kg       | 3 %       | (Lay et al., 2002)         |
| Avg. 882 g   | 38 %      | Avg. 1407 g  | 7 %       | (Le Dividich et al., 2017) |

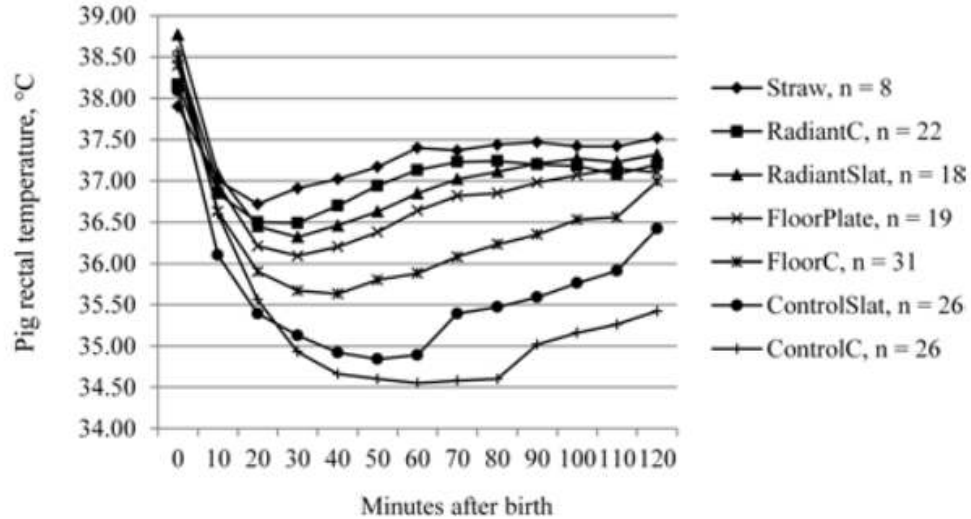
# LIFE SOCKS

## Internship i samarbejde med SEGES

- En sok som sweater i 80 % merino uld
- 140 grise under 900 gram, hver anden med sok baseret på vægt
- 14 dage i forsøg, sokken kom af på dag 3



# LIFE SOCKS





# LIGE NU

Forsøg med infuseret glucose eller saltvand (kontrol)

- 10 LY søer, 3 FEso/dag 1 måltid
- Sikre konstant blodsukker niveau
  - Reduceret farringslængde
  - Reduceret dødfødte





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