



# Improving udder quality traits in sows to aid survival, health and lifetime performance of piglets

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Pre weaning mortality in the UK is 11.5% of which 70% occurs during the first 4 days

Passive immunity

Energy for thermoregulation and body growth

**Colostrum intake is the key solution**

Growth factors for intestinal growth

Colostrum production decreases after 12 h

Essential to have a short delay to find a teat and suckle

**A good udder conformation reduces the time to suckle**



# Objectives

1. Define **udder conformation traits** measurable in a reliable way (first experiment)
2. Study the link between these traits, **colostrum characteristics** and **piglet performance**
3. Identify potential methods to quantify piglet performance and maternal colostrum production
4. Determine on-farm colostrum characteristics:
  1. Colostrum **extraction ease**
  2. Colostrum quality → **Immunoglobulin G**

# Materials and Methods

- Udder traits

- » Measurement
- » Linear score



- Piglet performance

- » Weight gain
- » Serum immunoglobulin G - **Immunocrit technique**

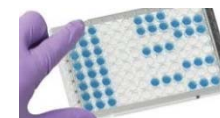
- Colostrum characteristics

- Extraction ease

- » Linear score

- Quality

- » Radial immunodiffusion **RID**
- » Enzyme-linked immunoassay **ELISA**
- » Refractometer **BRIX**
  - Fresh sample
  - Refrigerated sample
  - Frozen sample

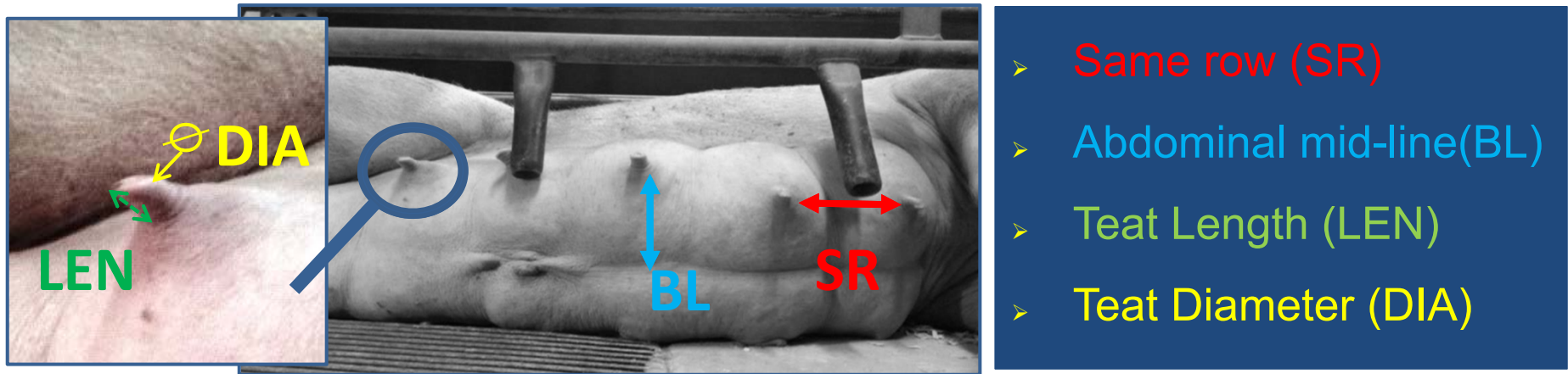


# Results from the first experiment

- Measures of udder conformation:
  1. are **repeatable** within sow,
  2. do **not differ significantly** between **sides** in either standing or lying **postures**,
  3. do **not change** in the days **shortly prior to farrowing**,
  4. show significant **variability** between **sows**,
  5. measures which use **anatomical landmarks** as the reference point are more **reliable** than those using the floor of the pen.

# Which traits define udder conformation?

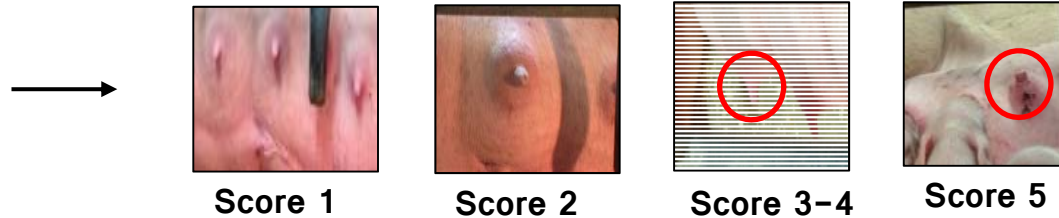
- Measurements of distance from the teat base to:



- Same row (SR)
- Abdominal mid-line (BL)
- Teat Length (LEN)
- Teat Diameter (DIA)

## Linear scoring:

- Teat orientation
- Udder damage
- Udder development



# Piglet Performance

## Immunocrit technique

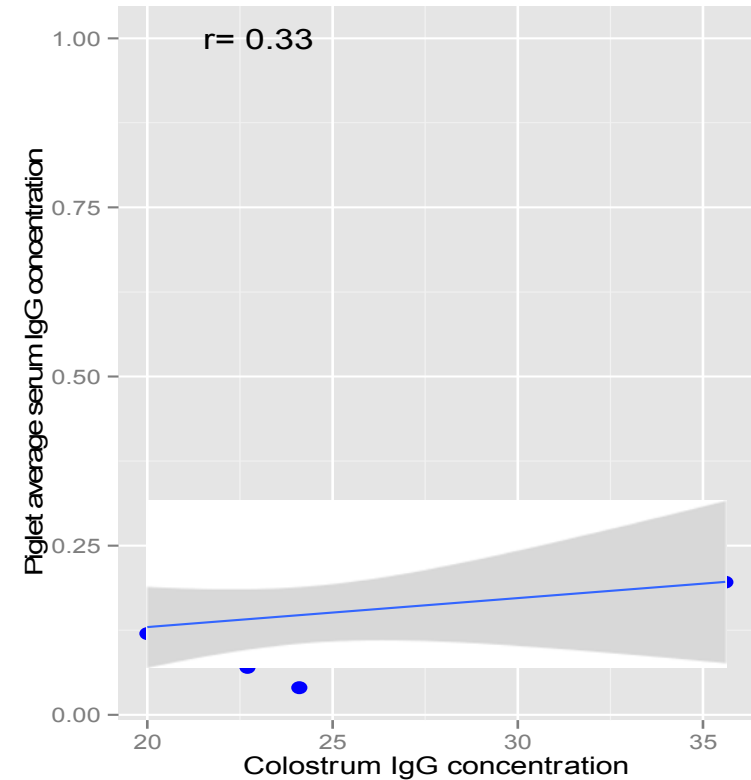
### BLOOD SAMPLE

- At 24 hours of age
- Puncture of the ear vein
- Draw blood into a microcapillary tube



### LAB TECHNIQUE

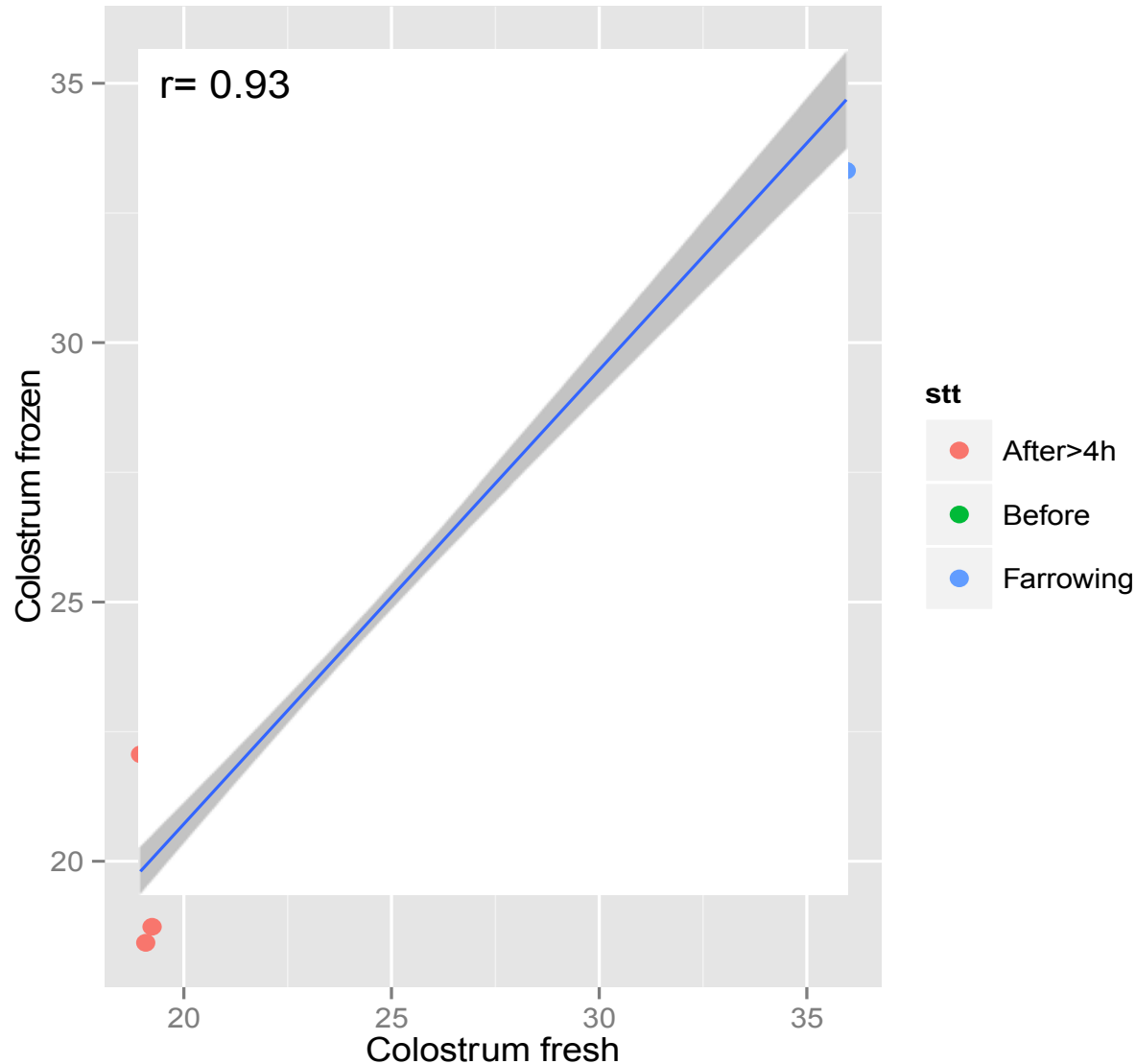
- Mix 50  $\mu$ l of serum with 50  $\mu$ l of ammonium sulphate
- Centrifuge
- Calculate the ratio of precipitate and supernatant to obtain **IgG concentration**.



Relationship between Sow colostrum IgG concentration (BRIX) and litter average piglet serum IgG (Immunocrit) (n=10).

# Colostrum characteristics

## Correlation fresh and frozen sample



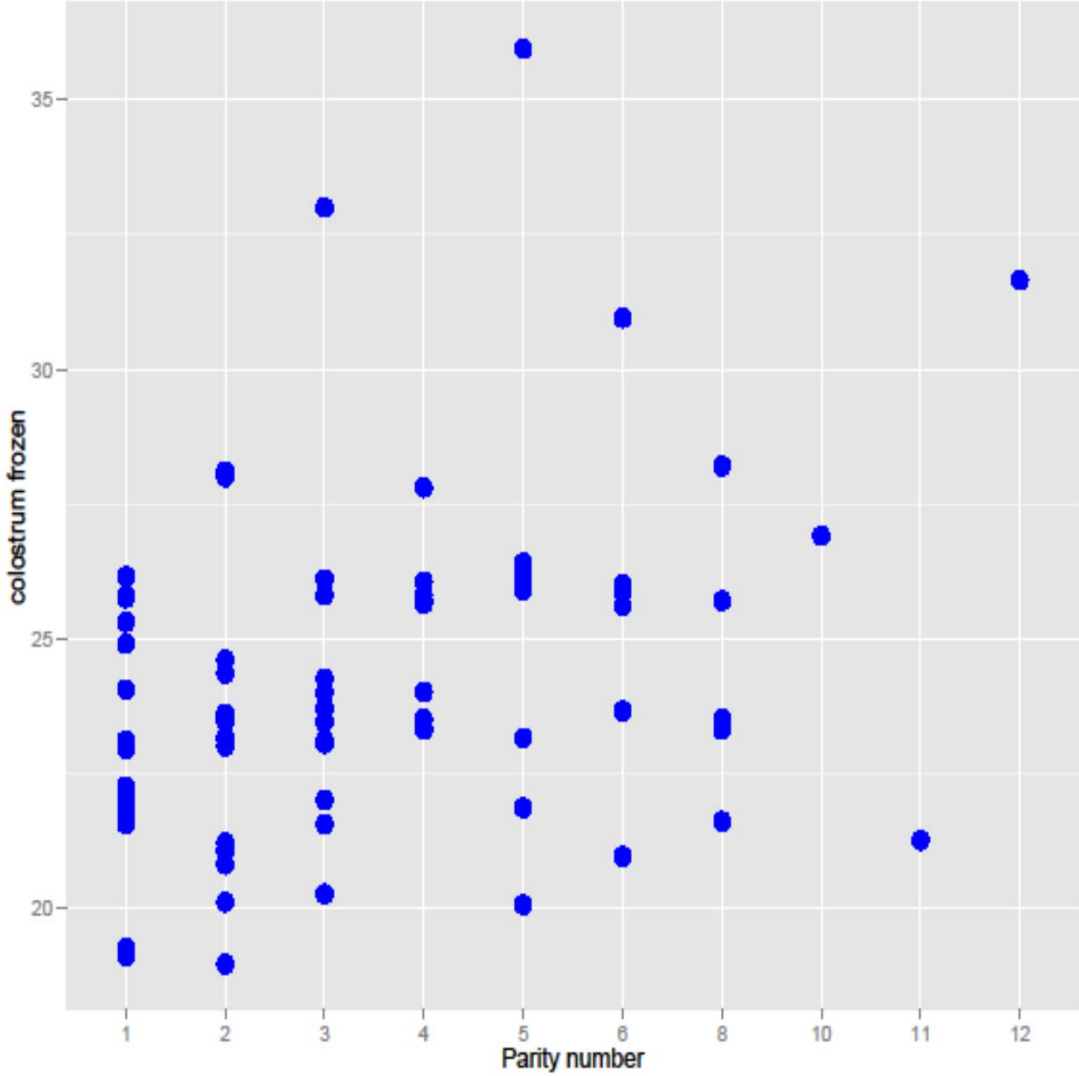
Correlation between BRIX of fresh and frozen colostrum samples (n=76), across sampling times

(before farrowing n=18, during farrowing n=35, >4h after farrowing n=23)



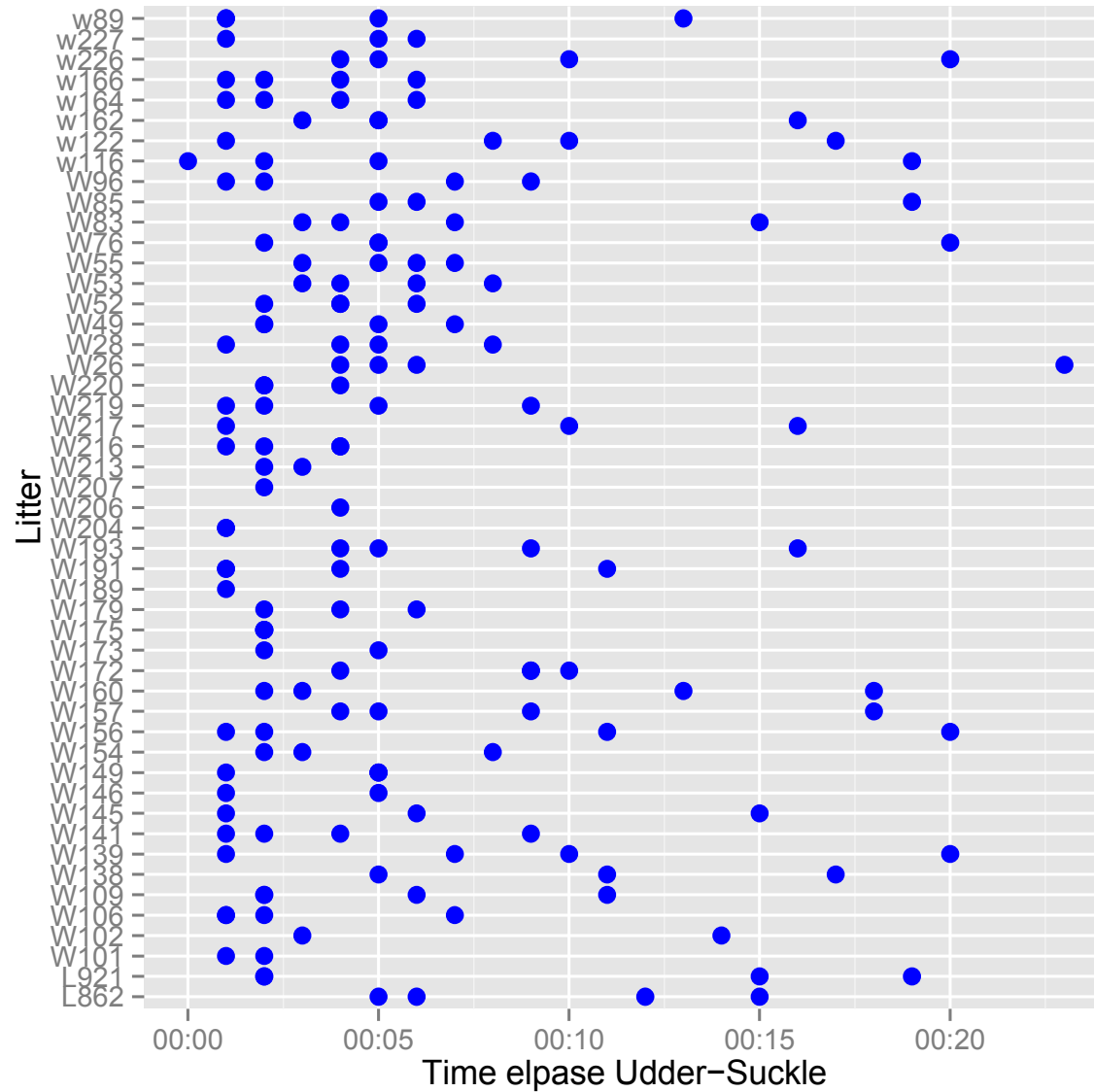
# Colostrum characteristics

## Colostrum IgG variation across parity



Relationship between Colostrum IgG concentration (BRIX) and sow parity number (n=76)

# Piglet behaviour



Distribution of time elapsed from when the piglet first contacts the udder to suckling.

(first 4 piglets born per sow; n=196).

# Next Step

1. Assess how udder conformation changes in consecutive parities of the sow
2. Genetic study on selected traits
  - heritability will be estimated for key udder traits
  - genetic correlations with other maternal selection criteria

# Industry focus

- Allow a breeding company to take udder conformation into account
  - Repeatable and reliable methods for **gilt selection**
- Increase number of weaned piglets
  - Allowing the selection of sows with **better nursing capacity**
  - **Improving colostrum accessibility and quality**

# ***Acknowledgements***

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- Professors Sandra Edwards & Heather Cordell
- Mark Brett, Darren Bromfield and all the staff at  
Cockle Park
- Mr Edward Sutcliffe of ACMC

