

# Prevalence and risk factors for limb and foot lesions in piglets

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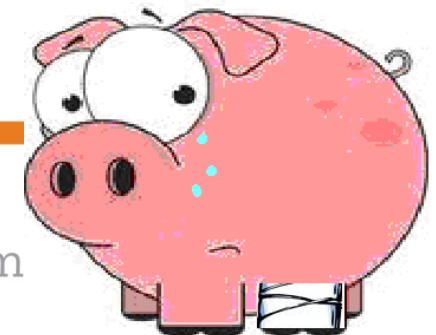
THE UNIVERSITY OF  
WARWICK



The Irish Agriculture and Food Development Authority

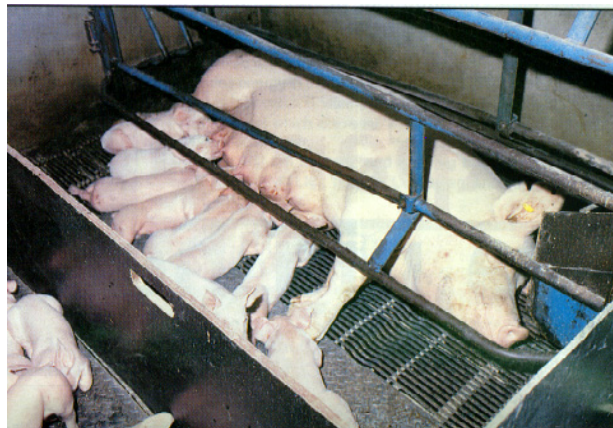
# Introduction

- A range of injuries affect piglets limbs and feet (KilBride et al., 2009)
- Prevalence & severity vary by lesion type & environment (Mouttotou et al., 1999; KilBride et al., 2009)
- Severe injuries can result in reduced performance & death
- Joint ill or lameness the cause of 2.8% of preweaning mortalities (Kilbride et al., 2012)
- Lower incidence of limb injuries in outdoor/bedded systems (Kilbride et al., 2012)
- Protective/cushioning effect of soft underfoot conditions
- Indoor systems operated without bedding?



# Objective

To investigate the prevalence of lesions and risk factors for limb and foot lesions in piglets reared in commercial intensive systems in Ireland and used across the EU



# Materials and methods

- Cross sectional survey of lameness & lesions with +10,000 pigs surveyed at all stages of the production cycle
- 68 pig farms surveyed (24% of Irish farms)
- Integrated farms >100 sows, visited once
- All piglets within 4 litters were examined per farm

# Litter selection



**n = 2948 piglets in 272 litters**

**3-7 days**

**8-14 days**

**15-21 days**

**22-28 days**

**n = 759**

**n = 752**

**n = 726**

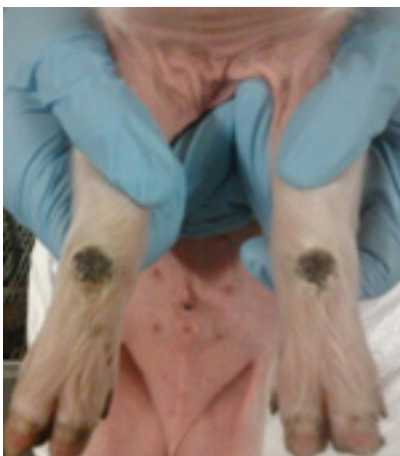
**n = 711**

# Limb & foot lesions

- Scored from 0-3, based on relative size

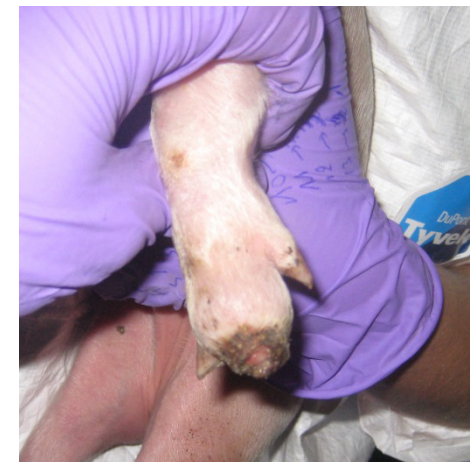
## Limb

- Abrasions
- Joint swelling



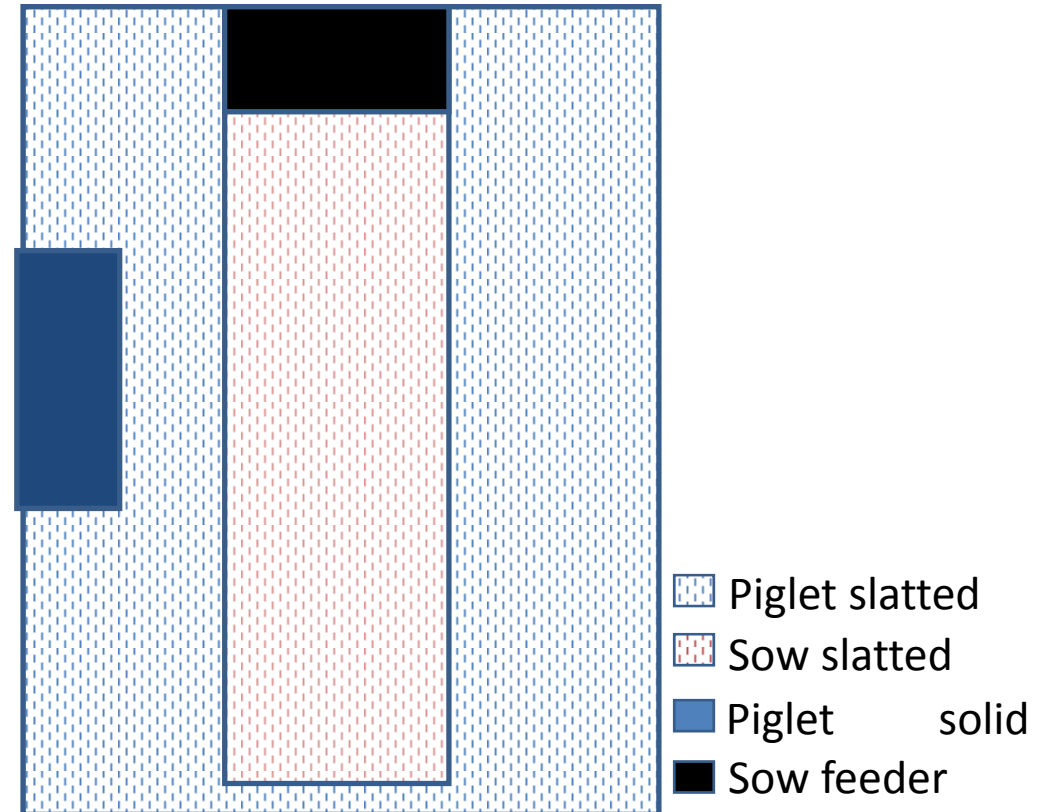
## Foot

- Sole bruising
- Sole erosion
- Coronary band damage
- Foot swelling

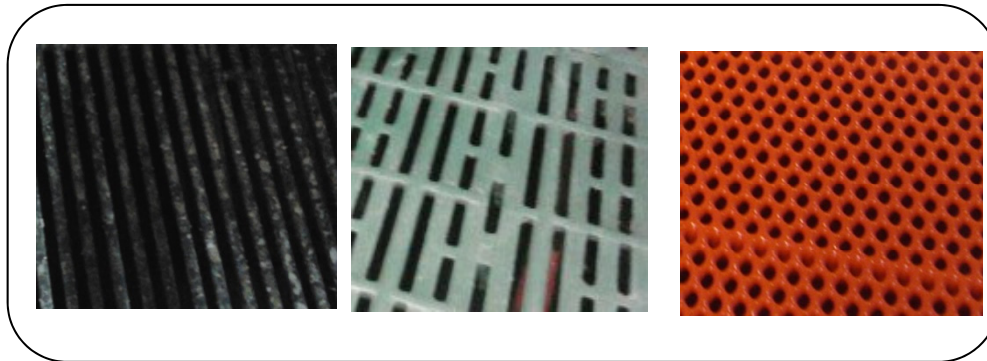


# Pen measurements (+80)

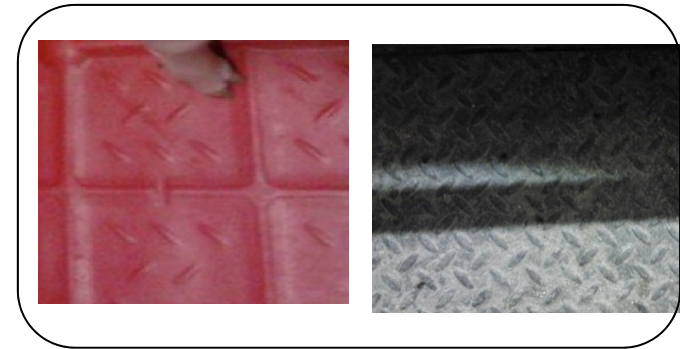
- Dimensions
- Slat dimensions
- Solid/slat proportions
- Surface features
- Flooring type



# Flooring categories



**Sow/piglet slatted area**



**Piglet solid area**

- Slat shape and flooring material used for the slatted and solid areas were correlated
- 6 flooring categories created





# Management parameters

## Questionnaire

- + 200 questions
- Husbandry
- Genetics
- Performance



# Data analysis

- All data entered into Microsoft access database
- Prevalence calculated for each lesion

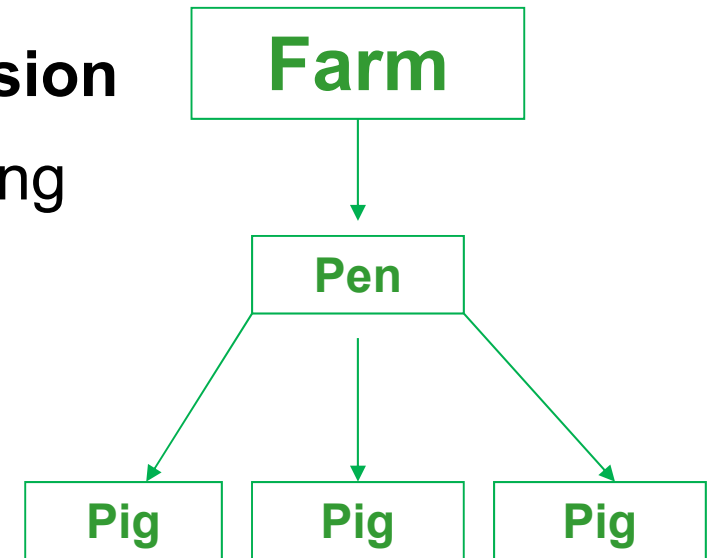
$$\frac{\text{No. of pigs with lesion score } \geq 1}{\text{No. of pigs examined}}$$

- Data were analysed using regression analysis in MLwiN 2.27

# Data analysis

## Multilevel mixed effect logistic regression

- Random effects to account for clustering
  - Pens clustered within farms
  - Pigs clustered within pens
  - 3 level models



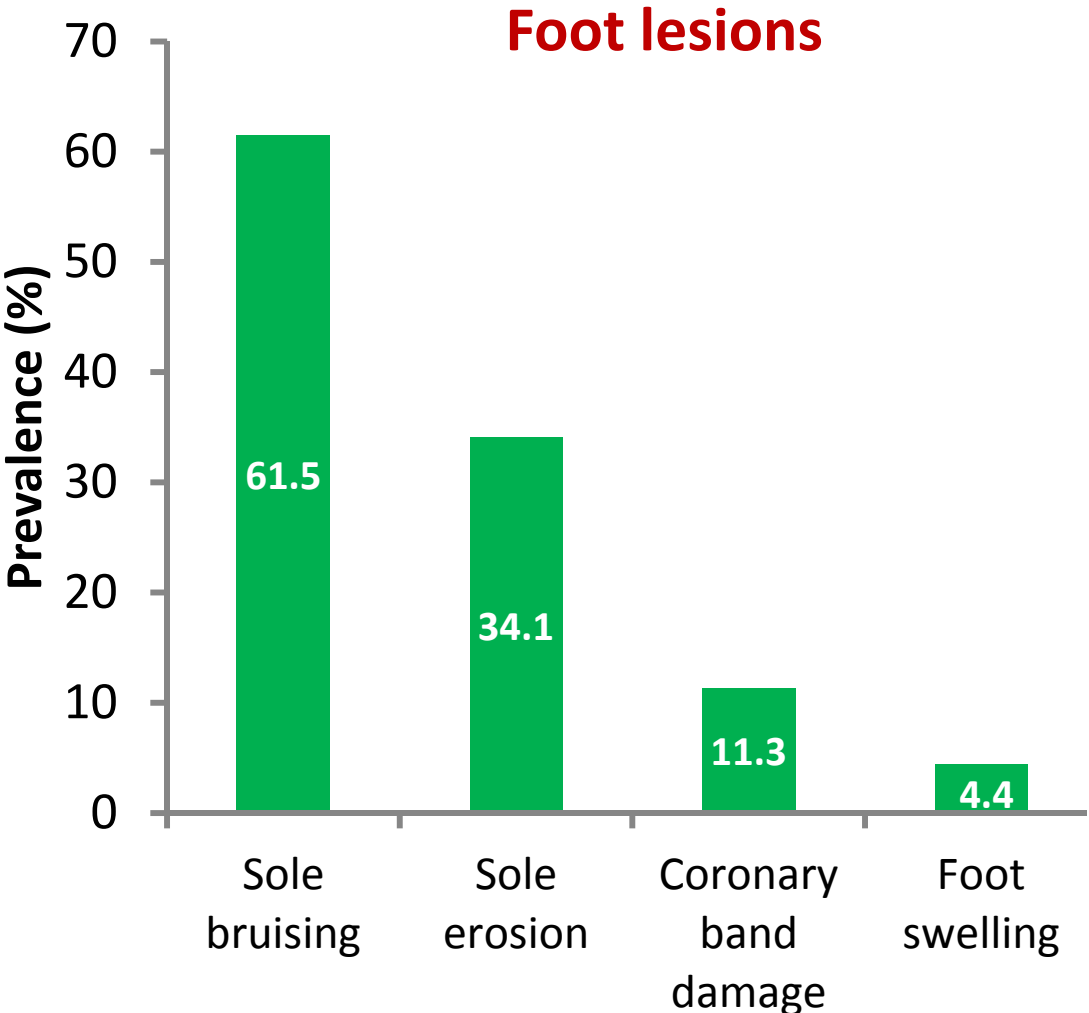
## Model building

- Predictor variables screened at  $p < 0.2$
  - Remain in final model if  $p < 0.05$
  - All remaining predictor variables tested again in final model to check for residual confounding
- Correspondence analysis to identify correlated variables

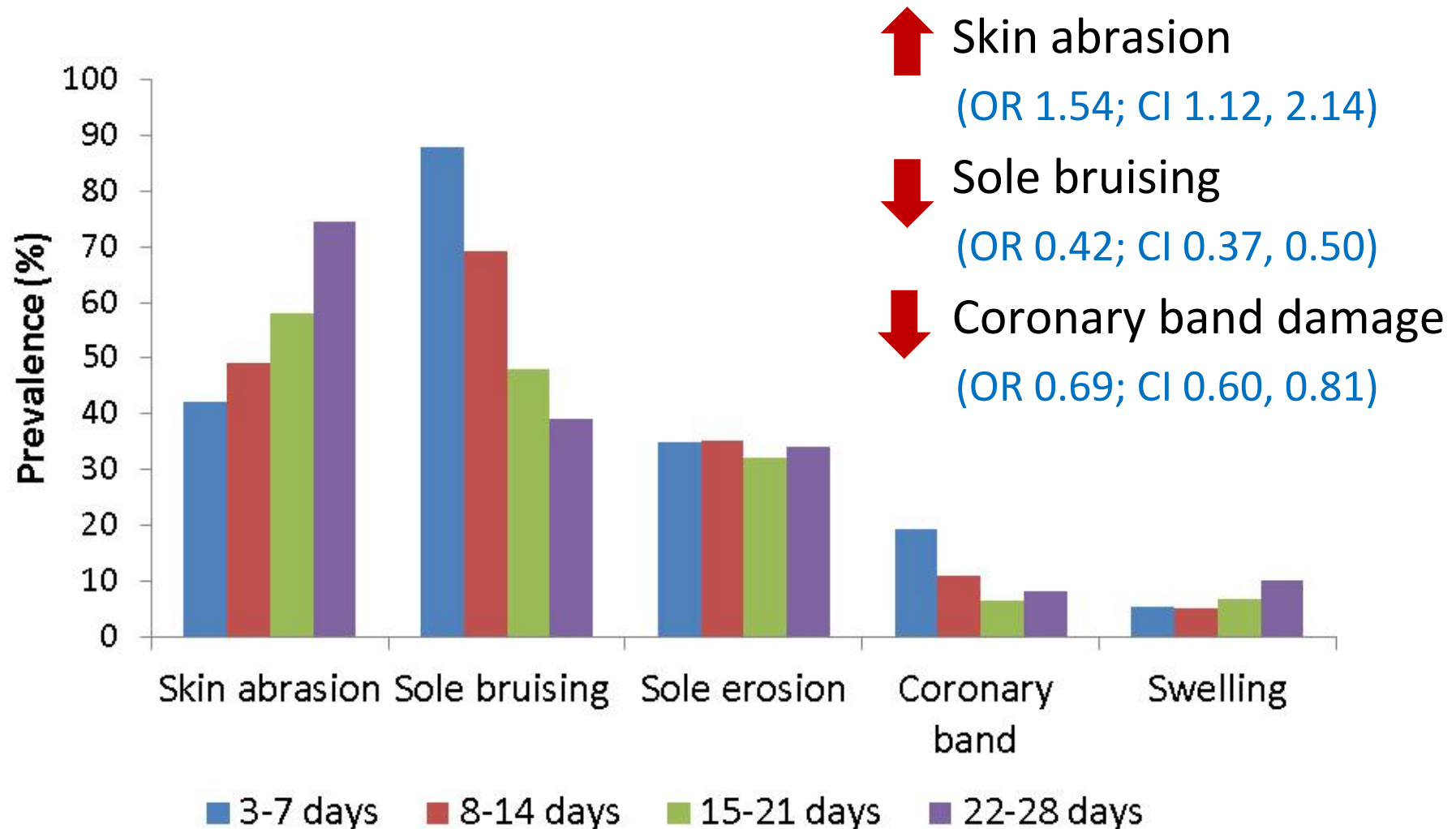
# Results



# Prevalence of limb & foot lesions in piglets



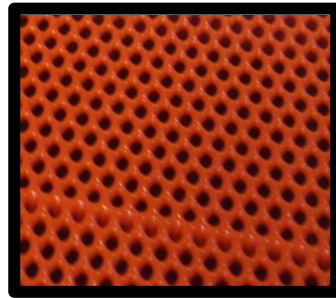
# Age as a risk factor for lesions in piglets



# Floor type was a risk factor for sole bruising

↓ OR 0.32; CI 0.15, 0.70

Piglet



+

Sow

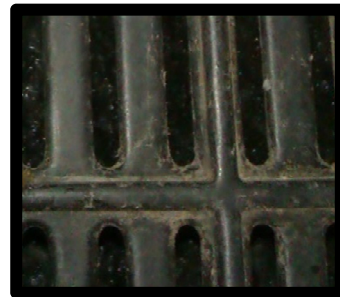


# Floor type was a risk factor for sole erosion



OR 1.81; CI 1.07, 3.09

**Piglet**



+

**Sow**



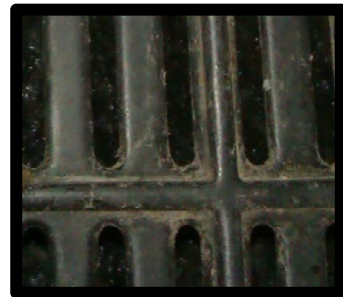


# Floor type was a risk factor for coronary band damage



OR 4.25; CI 1.96, 3.57

Piglet



+

Sow

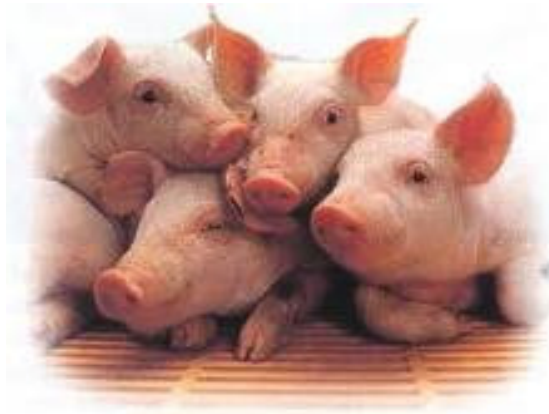


# Associations between lesions

- Limb swellings **+ve** association with limb abrasions ( $P < 0.001$ )
  
- Foot swellings **+ve** association with
  - Sole erosion ( $P < 0.001$ )
  - Coronary band damage ( $P < 0.001$ )



# Discussion



# Sole bruising

## High prevalence

- Absence of bedding in Irish systems

## Reduced risk with age

- Thickening of sole epithelium over time



## Reduced risk when oval plastic slats and a plastic solid area in piglet area & metal slats in sow area

- Oval shaped openings offer better weight distribution to the foot
- Reduces pressure on specific points of the foot

# Sole erosion

## High prevalence

- Welfare concern
- Entry site for bacteria



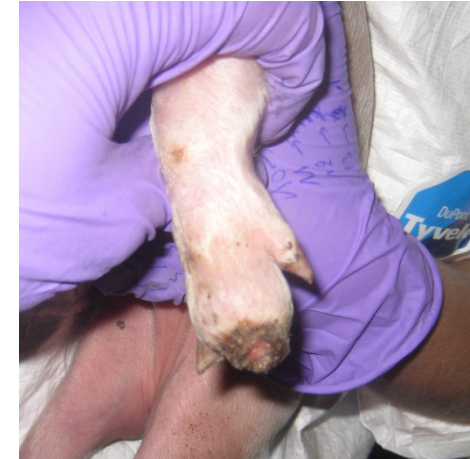
## Increased risk when metal slats in both the piglet and sow areas and a solid plastic area for the piglets

- Metal slats are considerably more abrasive than plastic slats

# Coronary band lesions

## Reduced risk with age

- Increasing resilience over time
- Increasing size of the foot, less likely to be trapped in slat voids



## Increased risk with metal slats throughout and a solid metal area for piglets

- Metal is a more unyielding material than plastic
- Applies more pressure to the coronary band if the foot trapped

# Limb abrasion

## Reduced risk with age

- Conflicts with previous studies
- Lack of bedding & floor types used varied



## No association between limb abrasions & pen floor type

# Limb & foot swellings



## Welfare concern

- Low prevalence but associated with internal infection and damage resulting in pain

## Increased risk with presence of sole erosion, coronary band damage and limb abrasions

- These lesions penetrate the epidermis
- Provide an entry site for pathogens which can result in infection



# Conclusions

No single floor category was consistently associated with a low prevalence of lesions

Avoiding the use of metal slats in the piglet and sow areas could reduce the occurrence of lesions that contribute to infection in foot and limb joints

# Any questions ?

