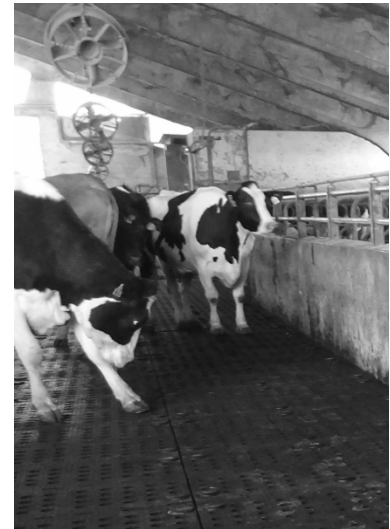


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***Effect of floor surface on behaviour  
and welfare of dairy cows***

Abstract 17522

**CRA**  
CONSIGLIO PER LA RICERCA  
E LA SPERIMENTAZIONE  
IN AGRICOLTURA



# INTRODUCTION

## Effects of flooring in dairy barns on welfare of dairy cows:

- mobility,
  - walking speed
  - fear of slipping or falling.
- hoof disorders, lameness.

## Rubber vs concrete floors:

↑ walking speed and stride length

↓ compression of the claw as the cow walks

Higher advantage for lame cows

Few experiments with slatted floors



## **Aim of the project:**

**Economic convenience of covering concrete non solid floors with rubber**

## **Specific aim of the experiment:**

**Comparison of welfare, behaviour and production of dairy cows reared on concrete slatted floor (CONCR) or on concrete slatted floor covered with a rubber mat (RUBB)**

# MATERIALS AND METHODS

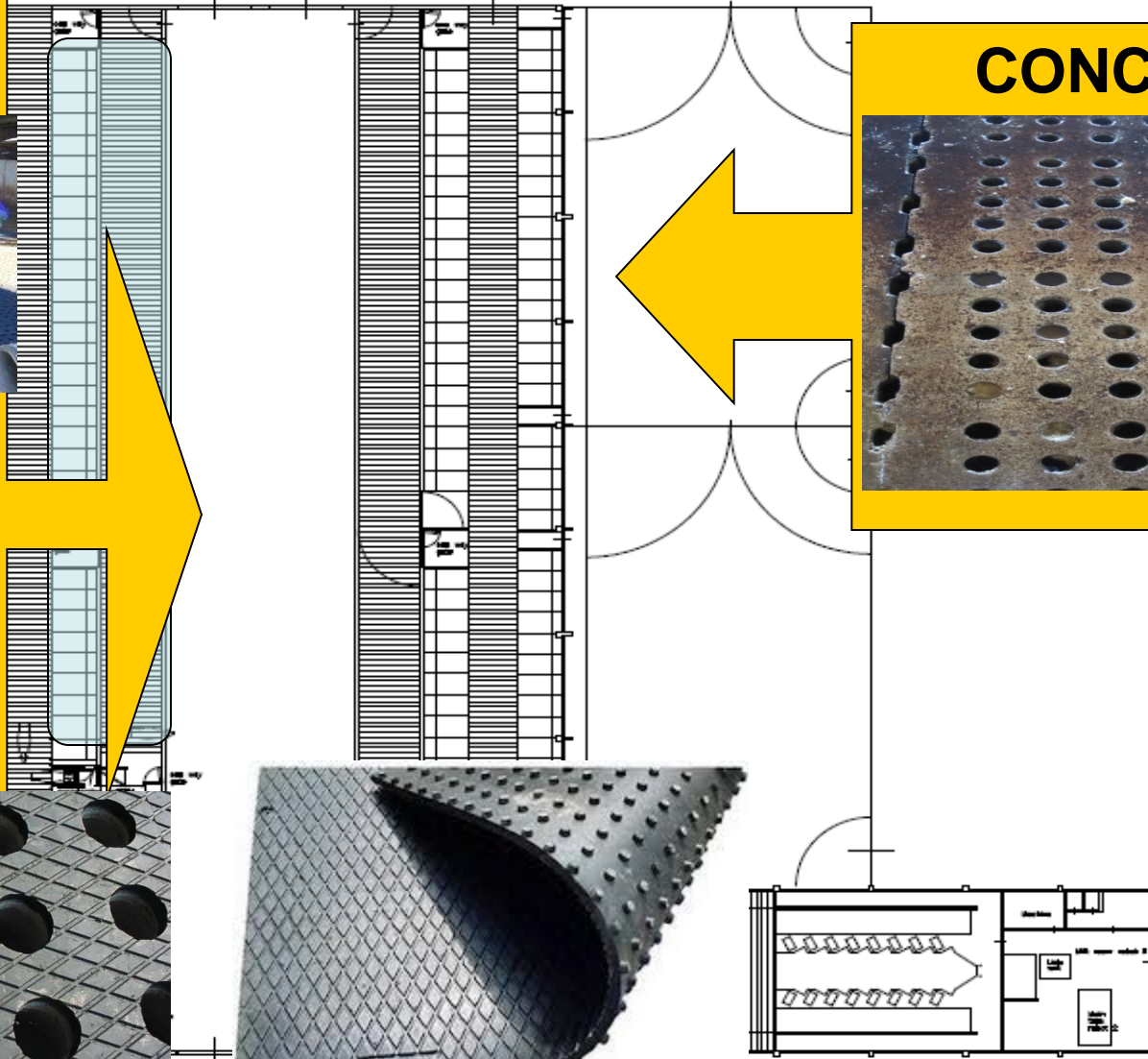
**RUBB**



Thickness: 20 mm  
Weight: 22 kg/m<sup>2</sup>



**CONCR**



# MATERIALS AND METHODS, animals

**56 Italian Friesian cows**

**assigned to one of the two sides of the barn so that**

**Groups were comparable for**

- **parity**
- **days in milking**
- **locomotion score**



# MATERIALS AND METHODS, measures

**claws Trimmed at 7.5 cm**

✓ **T0:1 month before the installation of RUBB, on February**

✓ **T1: 4 months after installation, on July**

✓ **T2: 7 months after installation, on October**

❖ **claw length:**

**Lateral and medial, rear right and front left**

❖ **horn growth:**

**burn mark on the rear right / front left foot, below the upper edge of wall**

❖ **claw horn lesions:**

**sole haemorrhages, sole ulcers, white line diseases, abscesses**

❖ **infectious lesions:**

**dermatitis, phlegmons**

# MATERIALS AND METHODS, measures

**After installation, 4 times on spring, 4 time on summer:**

- **From 07:00 - 14:00 ( interval between milkings) the number of cows standing/lying, eating, drinking and ruminating in feeding and resting areas was scan sampled hourly by direct observation**

**Once before and five times after installation, monthly:**

- **Locomotion**
- **Body condition**
- **Body dirtiness**
- **Milk yield**

# MATERIALS AND METHODS

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- **Statistical analysis**

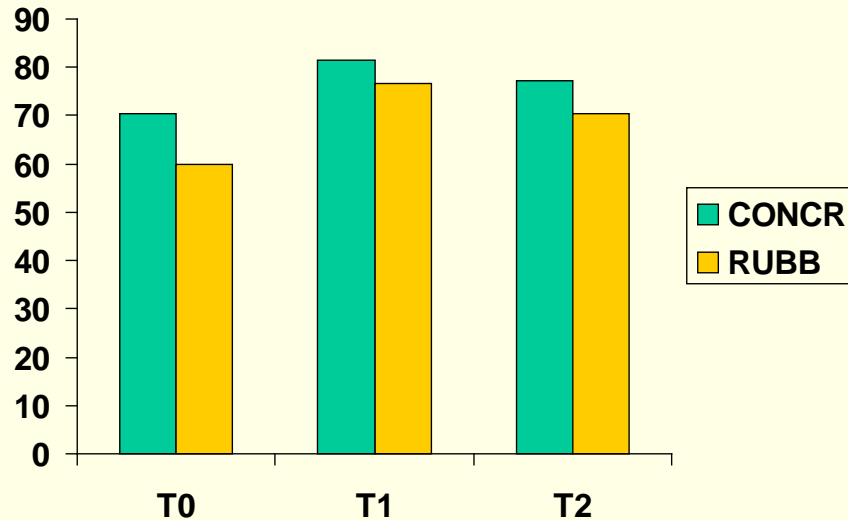
  - SAS /STAT software**

    - **Contingency tables and homogeneity of frequency distributions tested by Chi-squared test (feet health)**
    - **GLM procedure to test models with fixed effects only without repeated measures (horn growth)**
    - **MIXED procedure to test mixed models with repeated measures (behaviour)**

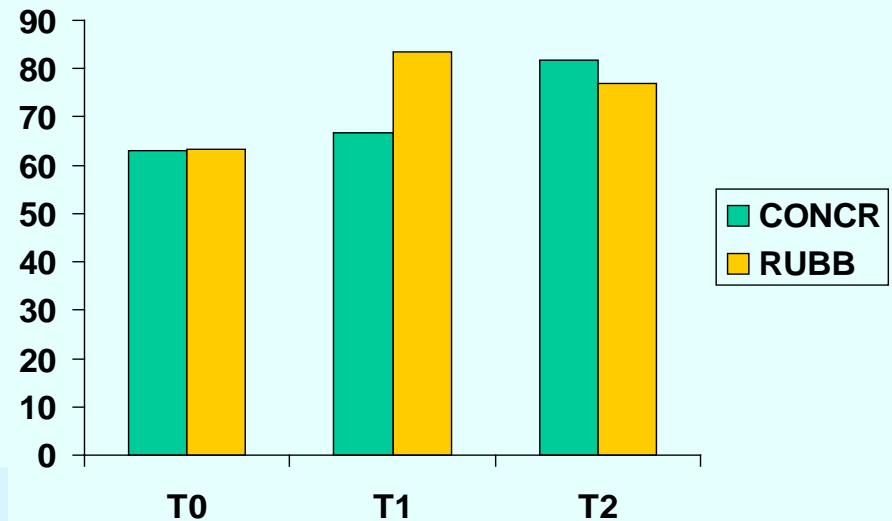


# RESULTS, feet health

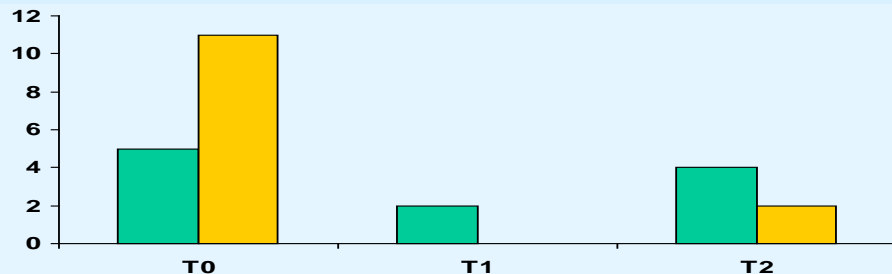
% of cows without claws lesions



% of cows without infectious diseases (dermatitis and phlegmon)



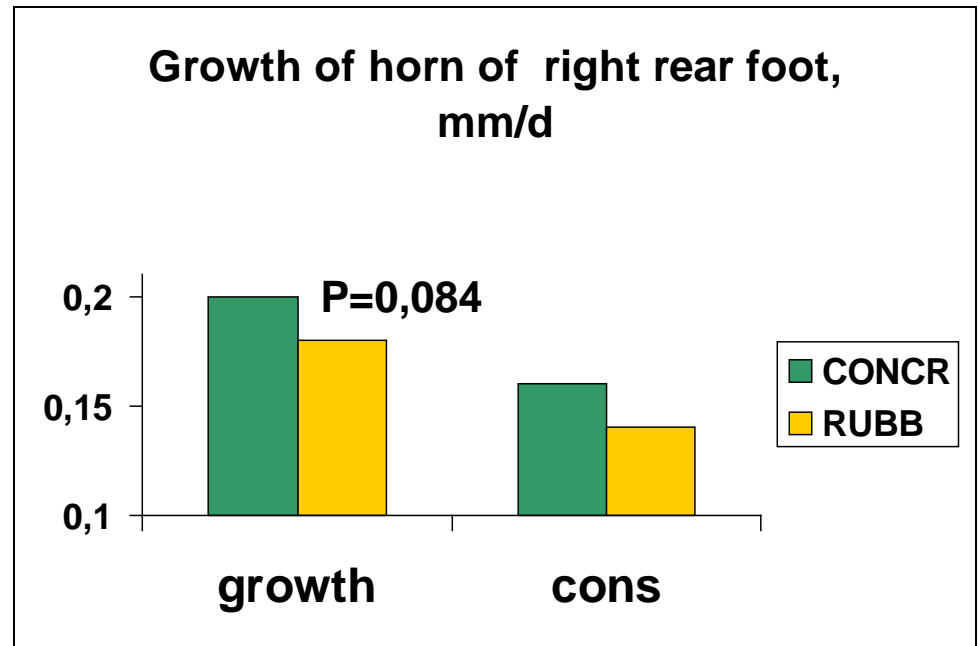
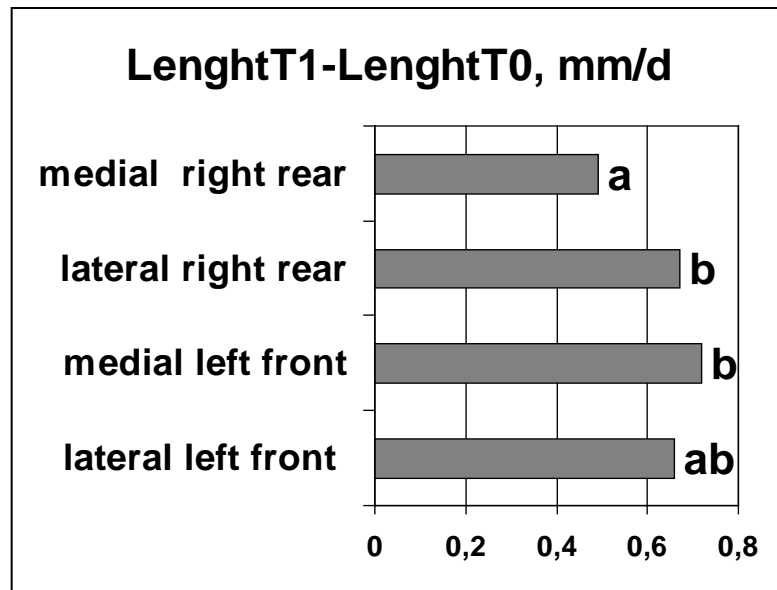
Frequency of sole haemorrhages,  
Chi-square (2 df)=4.8 (P=0.091)



# RESULTS, length of claws, horn growth, claws consumption

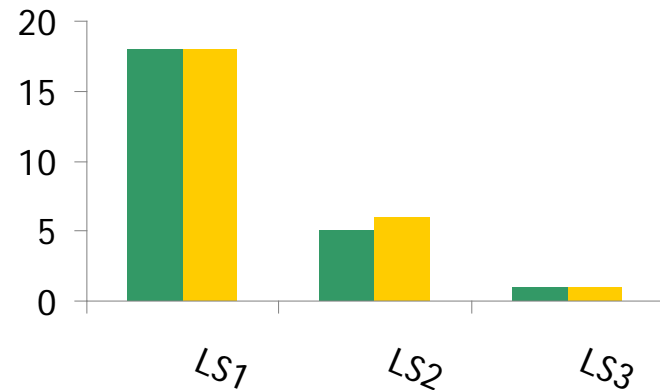
Length T1- Length T0 > length T2- Length T1 (mm/d)

T1

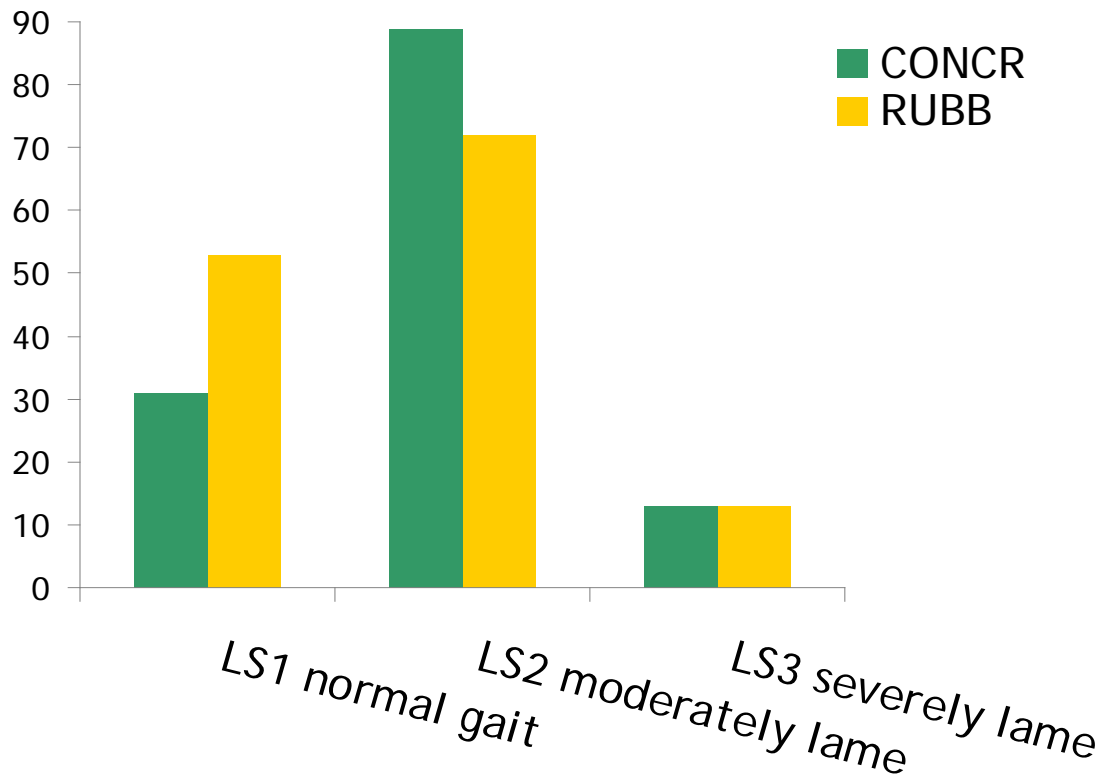


# RESULTS, locomotion score

Frequency distribution of LS at T0

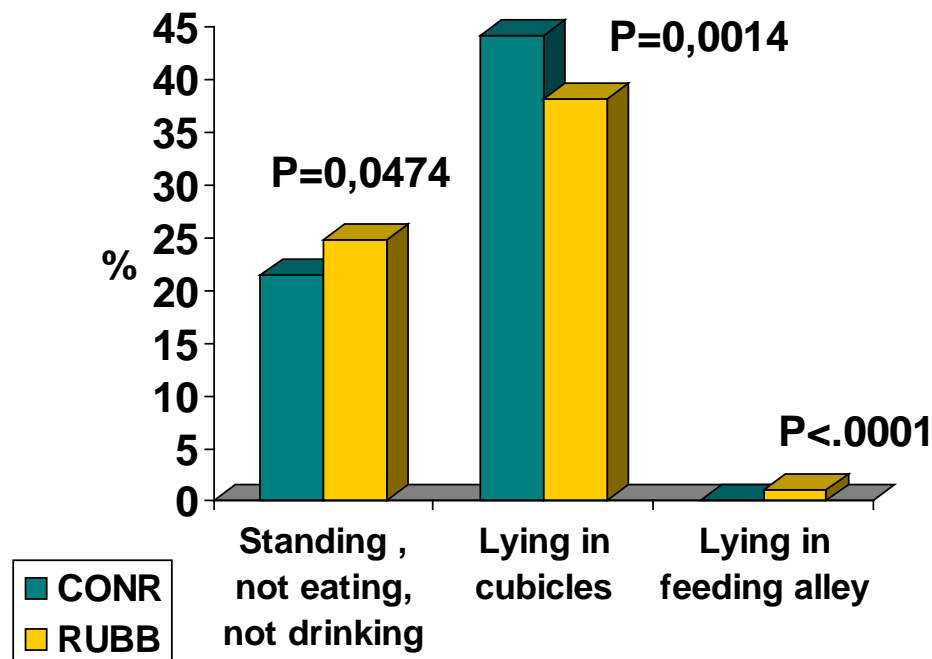


Frequency distribution of LS measured over the experimental period



**Frequency of LS over the experimental period was different for the two groups; Chi-square (2 df)=7.47 (P=0.024)**

# RESULTS, behaviour and performances



❖ % cows eating (head in the feeding gate) not different between groups

❖ total lying vs total standing not different between groups

- milk yield and body condition were not affected by treatment
- dirtiness of anogenital area was lower in RUBB than in CONCR (P <0.01).

# CONCLUSIONS

- Moderate positive effect of rubber on the feet health
- Evident positive effect of the rubber on the locomotion score
- Evident effect of the rubber on the behaviour indicating higher comfort but also potential negative consequences depending of other factors (barn layout, comfort of cubicles, thermal comfort)

Work in progress:

Interactions between different measures

Locomotion activity (accelerometers)

Reproduction, mastitis, pathologies,

Physiological analyses (haematological and metabolic profile)