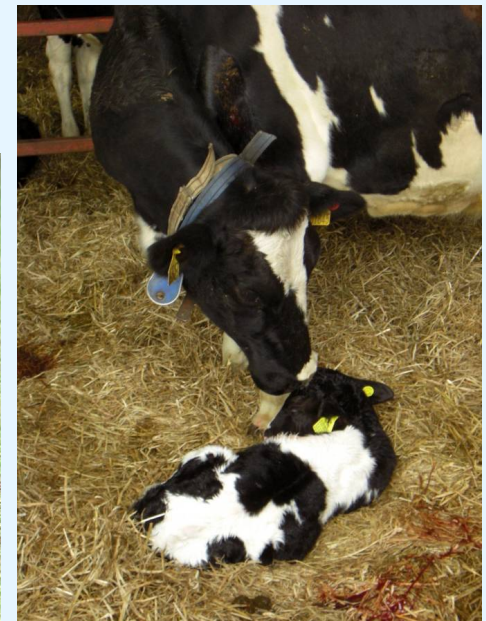


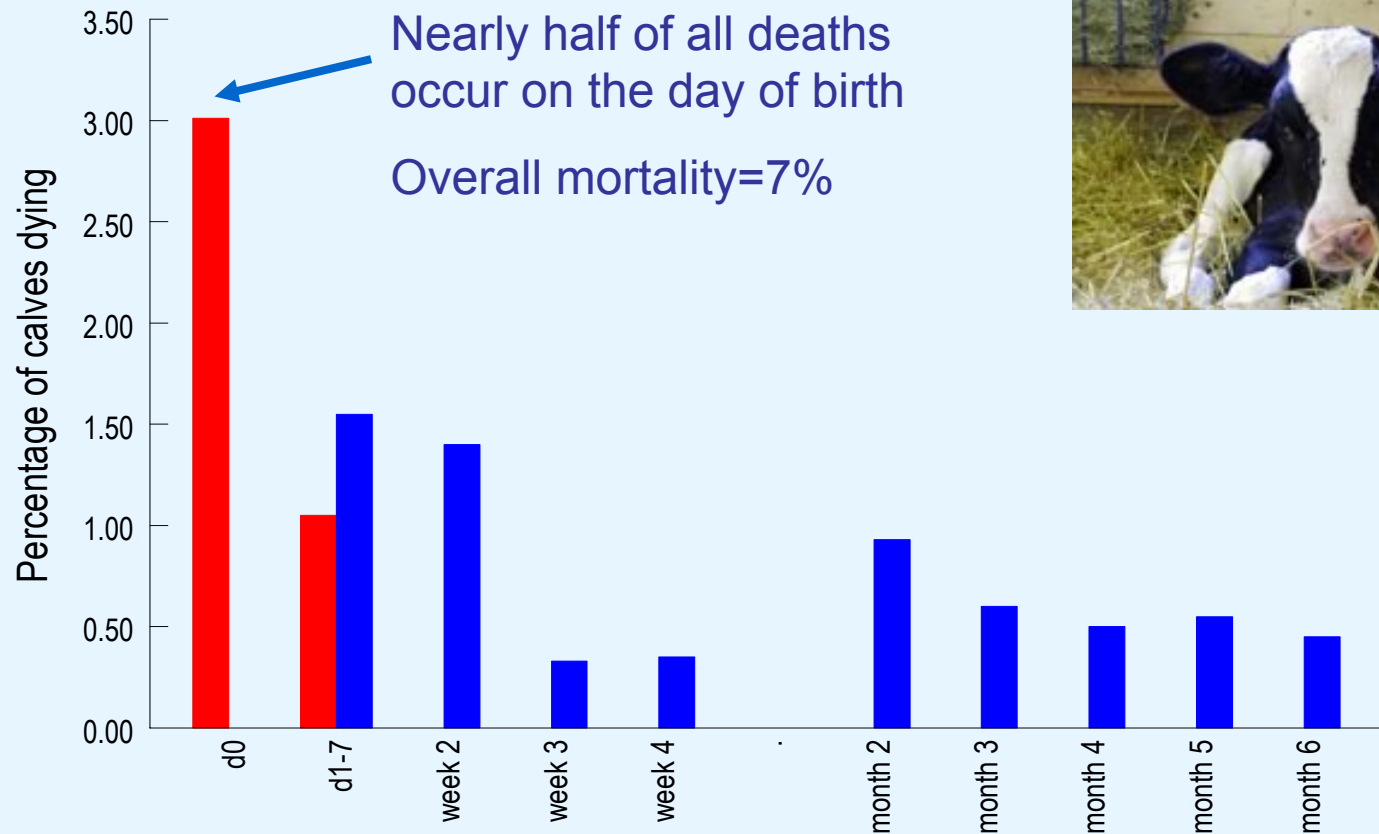
# Impact of a difficult birth process on maternal and neonatal health and development

Cathy Dwyer



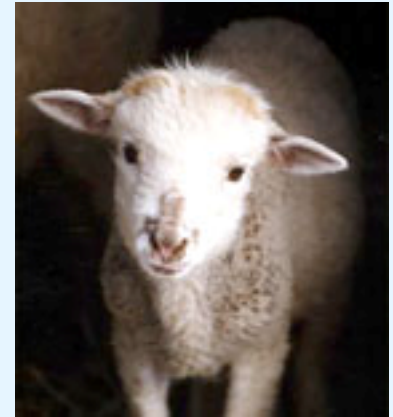
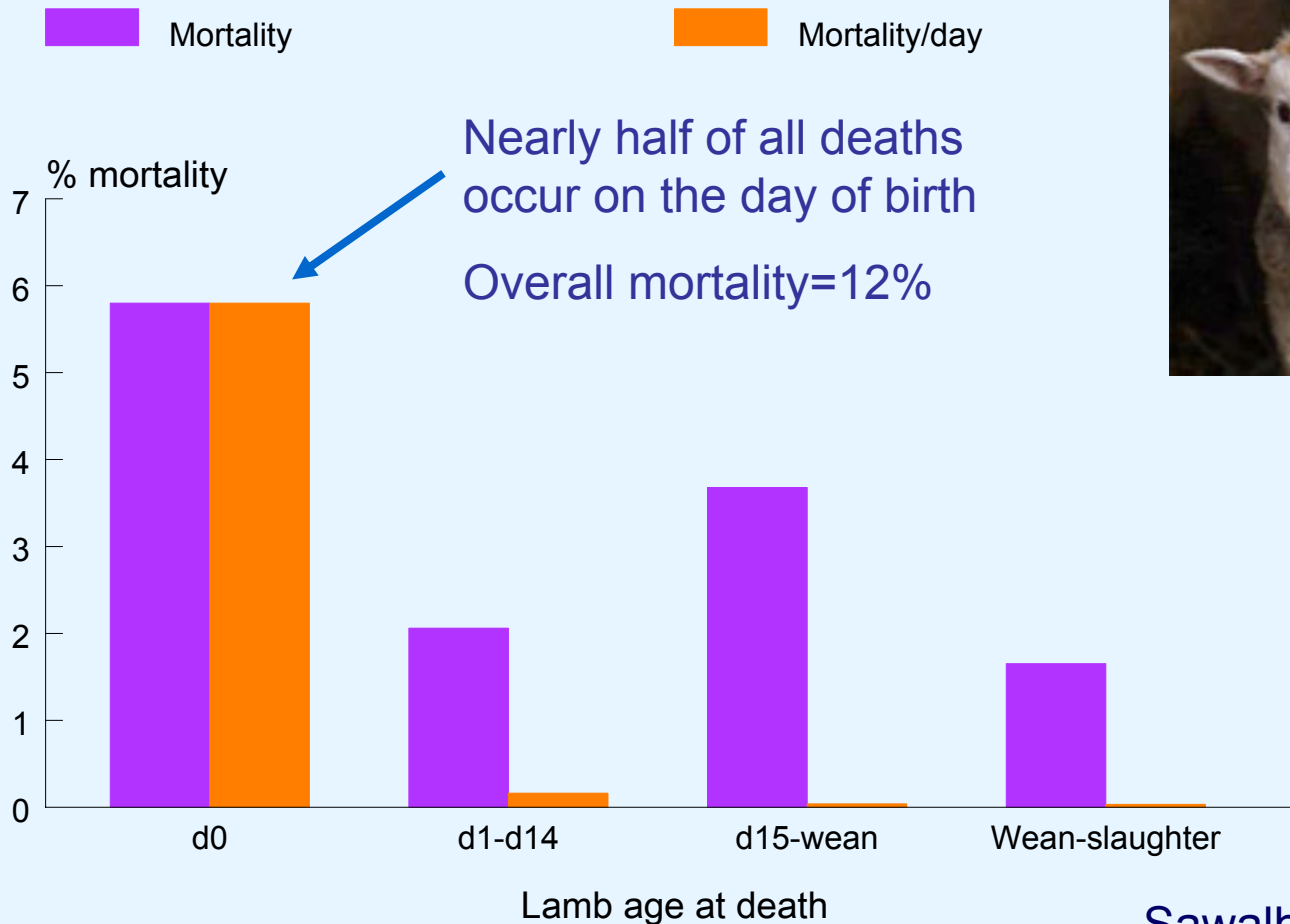
# Birth is intrinsically risky!

## Calf Mortality



# Birth is intrinsically risky!

## Lamb Mortality



# Difficult deliveries



- Births requiring human intervention to deliver the offspring, or excessively prolonged births
- Associated with an increase in offspring mortality in cattle, sheep, pigs and horses
- Are there additional costs to the mother and offspring of a difficult birth process?

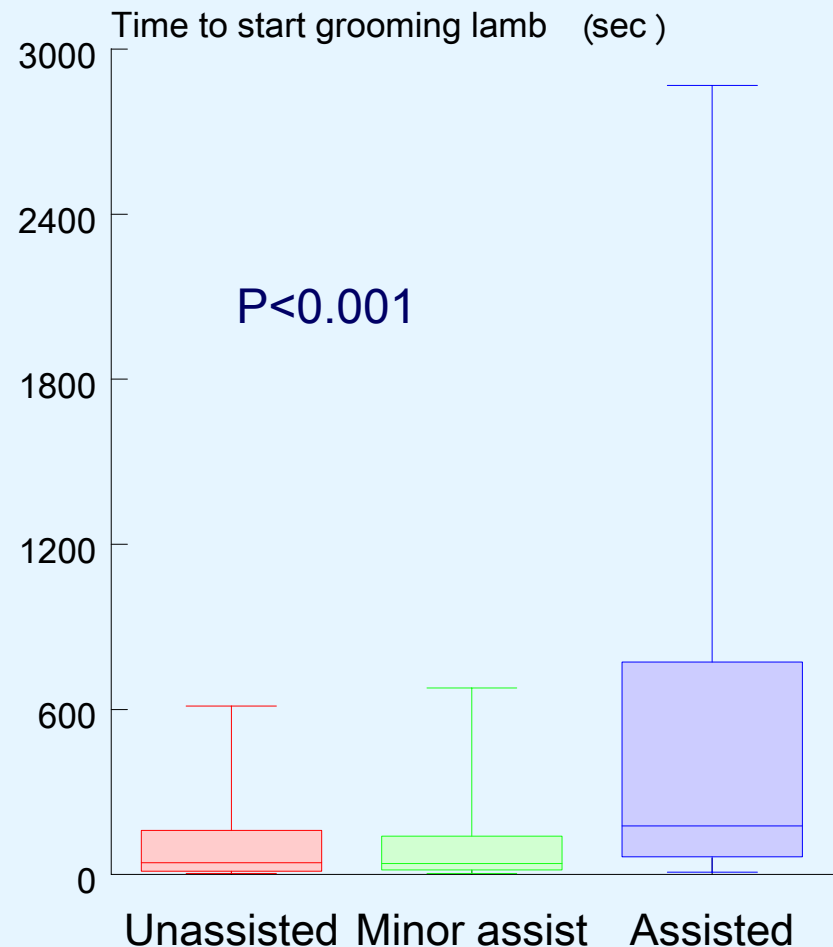
# Parturition and the mother



- Parturition is painful – when does that pain become unacceptable?
- Little/no research on use of analgesics during parturition in animals
  - Stress effects on parturition of administering analgesics
  - Impact on underlying physiological processes, e.g. oxytocin, opioids
  - Beneficial with assisted deliveries?
- Effect of pain on expression of maternal behaviour and maternal health

# Assisted delivery and maternal behaviour (sheep)

- Longer labour = longer to start grooming (licking) lamb after birth ( $P < 0.05$ )
- Longer labour = less grooming in first 2 hours after birth ( $P < 0.01$ )
- Tend to make fewer maternal bleats ( $P = 0.1$ )



# Assisted delivery and maternal behaviour (dairy)



- Assistance did not alter the onset of maternal behaviour – although there was considerable individual variation
- Assisted cows showed only a few postnatal indicators of pain compared to unassisted cows, we are still investigating pain indicators during labour



# Longer-term effects on the mother (cattle)



- **Decreases milk yield in dairy cows** (Tenhagen et al., 1999; Sophie Eaglen, Alice Barrier)
- **Increases culling rates, especially in primiparous cows**
- **Increases incidence of mastitis (beef and dairy;** Menzies et al., 2003; Tenhagen et al., 1999)
- **Increases infertility in beef and dairy;** appears to related to length of labour in beef (Doornbos et al., 1984) (Sophie Eaglen, Alice Barrier)

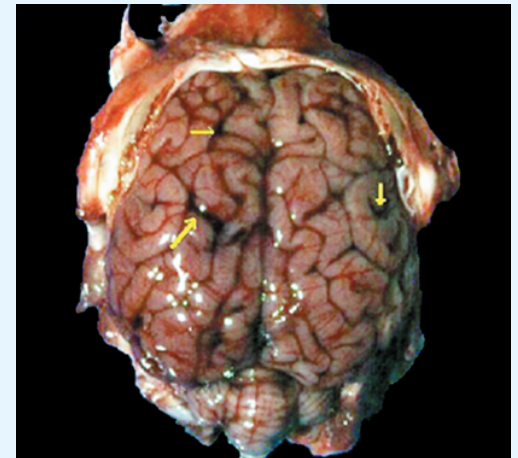


# Effects on the neonate



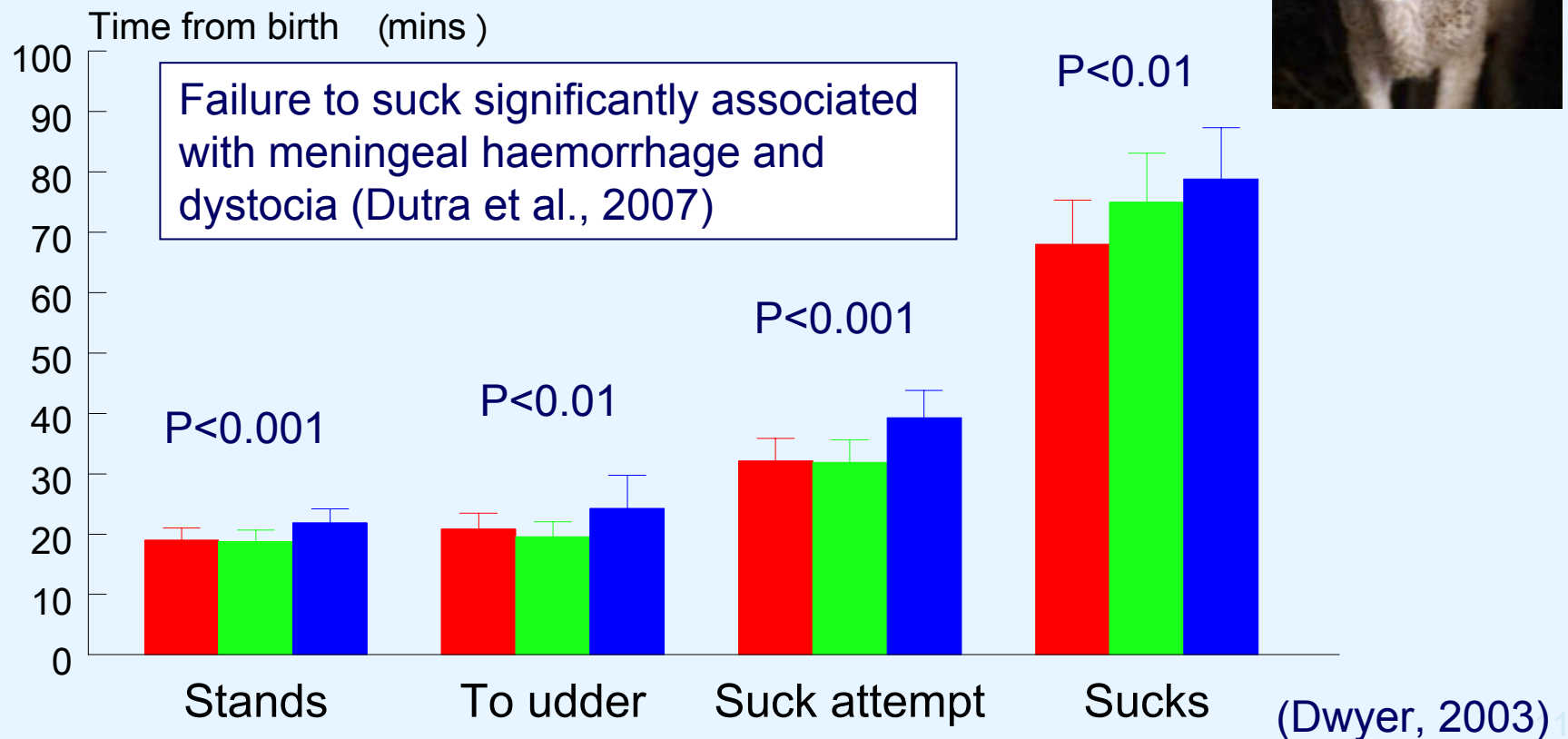
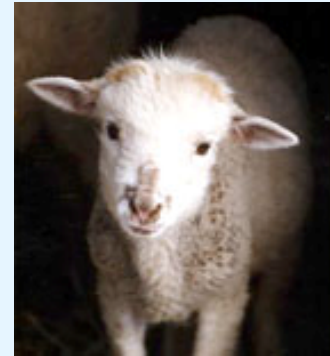
# Parturition and the offspring

- Significantly more likely to die after an assisted delivery:
  - Asphyxia during delivery (70-90% stillborn piglets)
  - CNS haemorrhage (70-80% of calf and lamb perinatal mortalities)
  - Physical trauma during delivery (7% calves delivered with traction have fractures)
- Effects on adjustment to postnatal life

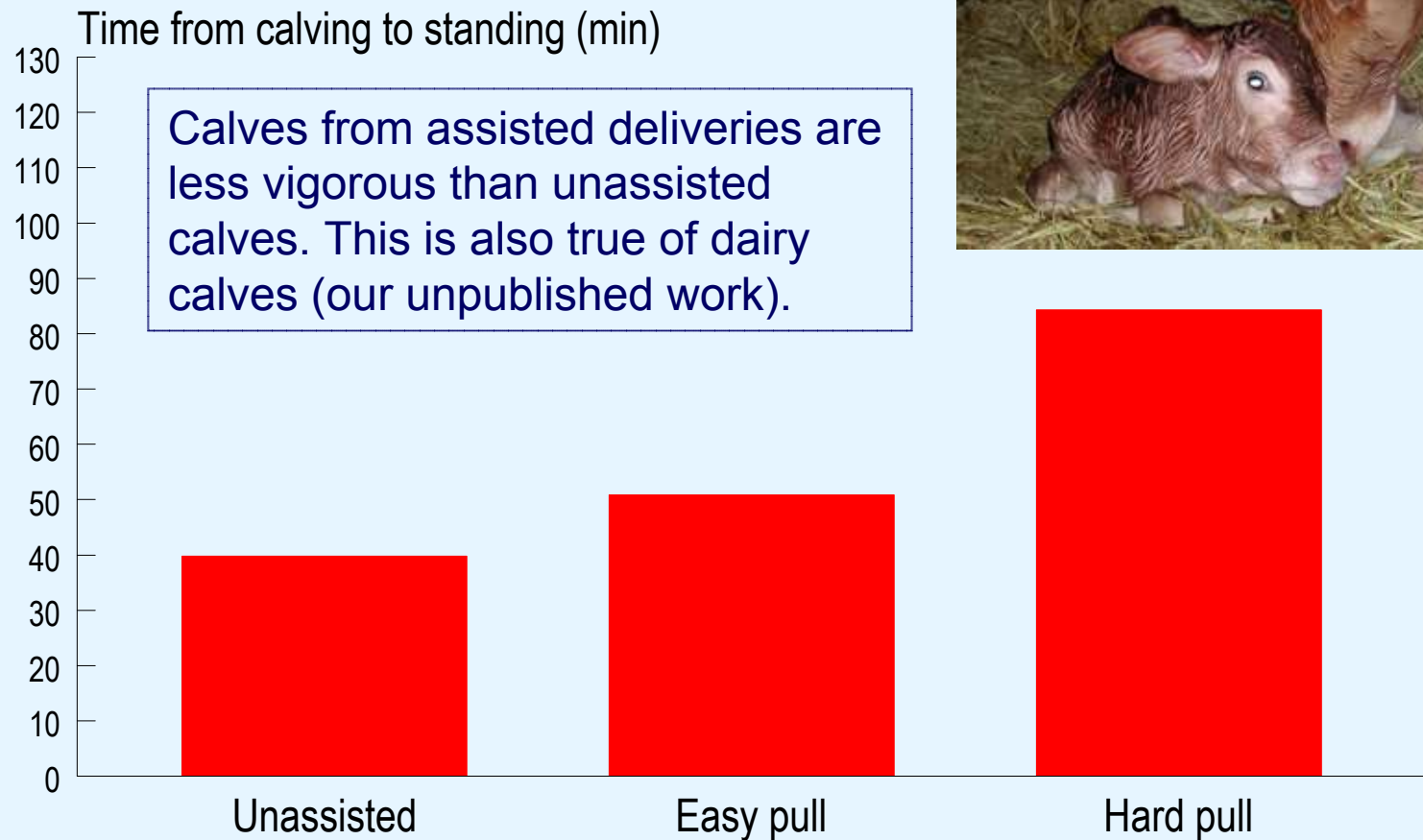


# Effects of birth difficulty on offspring vigour

Unassisted Minor Assist Assisted

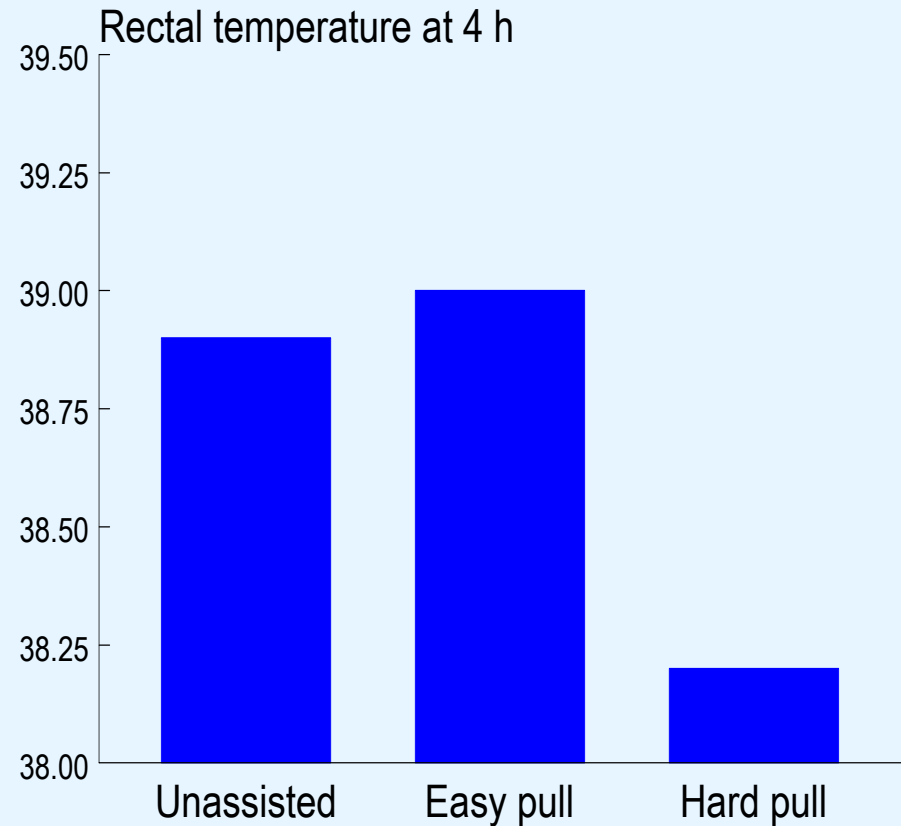


# Birth difficulty and calf vigour (beef)



# Effects of birth difficulty on offspring vigour

- Lower plasma IgG at 24 h in calves
- Higher plasma glucose in beef calves
- Higher plasma cortisol in lambs and calves
- Reduced ability to raise body temperature in response to cold:



(Bellows & Lammoglia, 2000)

# Longer-term effects on the offspring (cattle)



- Lower growth rate and weaning weights in beef and dairy calves (Goonewardene et al., 2003; Barrier et al., 2009)
- Greater incidence of respiratory and digestive diseases to 120 days (Lombard et al., 2007)
- No effect on subsequent fertility of dairy heifers previously experiencing a difficult delivery (Barrier et al., 2009)
- Dairy heifers have lower subsequent milk yield if they themselves had a difficult birth (Sophie Eaglen)

# Conclusions



- Difficult births cause pain and stress to mothers and offspring and increase offspring mortality
- Longer term effects of a difficult delivery can affect health and welfare of mother and young
- Reducing the incidence of difficult deliveries will improve welfare and productivity



# Practical applications



- Management to prevent dystocia:
  - Prenatal management of mother
  - Quiet, stress-free birth environment
  - Sire selection, especially for first time mothers
- Genetic selection to reduce incidence of dystocia
  - Heritability in sheep of 0.206 (MacFarlane et al., 2010)
- Sympathetic management of dystocia cases:
  - Care in the use of traction
  - Additional support to mother and young

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# SAC

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