Validation and application of an indoor localization system for cattle

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Background
• Increased farm sizes – more cows per man

➢ Possibilities localization tool?
  • Support finding of attention cows
  • Other applications? Accuracy?

Objectives
• Validation of electronic localization system
• Exploring further potential of system

Materials & Methods
The system consists of beacons placed at a height of 3-4 m in the barn, labels around the animal’s neck and an antenna and a processing unit. Tests consisted of:
  - static accuracy tests
  - tests for monitoring animal behaviour

Results

Static accuracy tests

• The absolute distance between the real positions and the positions estimated by the positioning system was in average 30.5 cm with a standard deviation of 25 cm
• Results are comparable with the results of Gygax et al. (2007), who validated a system developed by Abatec.

Results

Monitoring animal behaviour

• Classification staying accuracies:
  – in cubicle section: 95.1 %
  – in slatted floor section: 88.5 %
  – in feeding fence section: 91.9 %

• Based on a comparison of animal positions in the barn recorded each 5 min by visual observations with positions calculated by the localizations system good accuracy scores for staying locations of individual animals were obtained.

Results

Use of animal behaviour information from localization system

• Continuously location recording offers possibilities for calculating animal activity
• Changes in the feeding ration were related to the time spent in the feeding fence area

Conclusions
• The overall mean system accuracy was 30.5 cm
• Good scores for use of facilities
• Excellent potential for online monitoring of animal behaviour for management purposes

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