



## **Institute for Human Centered Engineering**

### **HuCE – BME Lab**

#### Project Description

## **Determination of the Transit Time through the Intestine of Cows with Cecum Dilatation-Dislocation**

Cecal dilatation-dislocation (CDD) is a common and economically important abdominal disorder that affects mainly dairy cows. Affected animals show a reduced appetite, milk drop, colic and diminished or even lack of defecation due to constipation of the cecum with ingesta. Despite several studies, the pathogenesis of CDD little is known so far. Results from previous studies suggest that the cause of CDD is not in the cecum itself but can be in a more distal part of the colon.

In the planned study, the transit time between different sections of intestine (ileum, cecum, colon and rectum) in cows after CDD is to be measured. By comparing the intestinal transit times of various sections to the rectum in different animal groups, the area where the dysfunction, leading to CDD, occurs can be localized.

#### **Results**

To determine the above mentioned transit times, a small, implantable capsule with built-in temperature sensor and wireless data transmitter was developed. The principle is based on the fact that the measured temperature will drop abruptly at the moment where the capsule leaves the intestine of the cow (drop from the body temperature of the cow (38.5-39.0°C) to ambient temperature).

The data packets sent from the capsules are captured by a receiver in close proximity of the cow.

Design parameters of the capsule:

- Size: 22x8.6mm
- Power supply: 2x1.55 silver oxide cells
- Meas. period: 3s
- Battery lifetime: 15d
- Range:10m

#### **Project Partner**

Wiederkäuerklinik der Vetsuisse Fakultät Bern  
Prof. Dr. med. vet. Mireille Meylan  
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#### **Project Team at HuCE**

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