

## **Cyber Animal Systems – Visible Rumen**

### **Abstract**

Cyber Animal Systems aim to ensure continuous and individualized care for livestock. Continuous real-time monitoring of health markers, such as ammonia, methane, pH, and temperature in case of ruminants, is essential to guarantee individualized care. Monitoring of biomarkers requires efficient intra-body communication from inside the body to the outside. Establishing and maintaining intra-body communication links is a non-trivial task requiring accurate knowledge of the physiology and electromagnetic properties of the rumen. Visible rumen experiments aim to identify and model the physiological and geometric models of the body, combining them with the observed RF response to create a rich high frequency electromagnetic simulation (HFSS) model for validation and future experimentation. Using the knowledge gained from these experiments, we hope to create a continuous monitoring low-power intra-body network for Cyber Animal Systems.