CPH- CATTLE
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Non-Invasive Sound Technology for Monitoring Rumen Contractions

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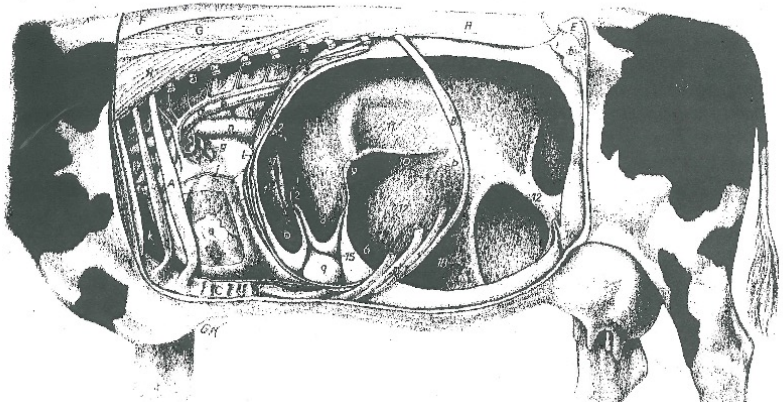
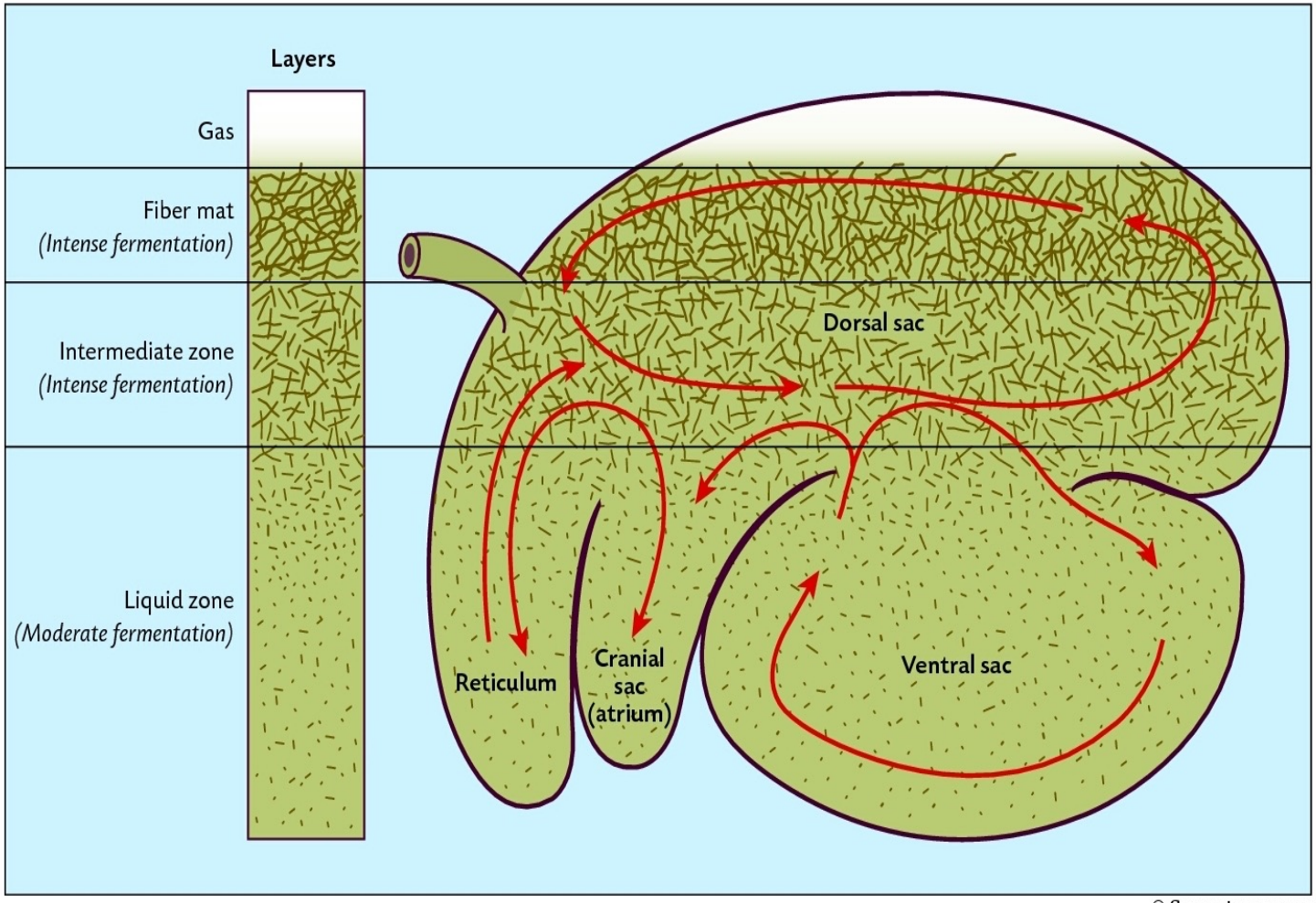




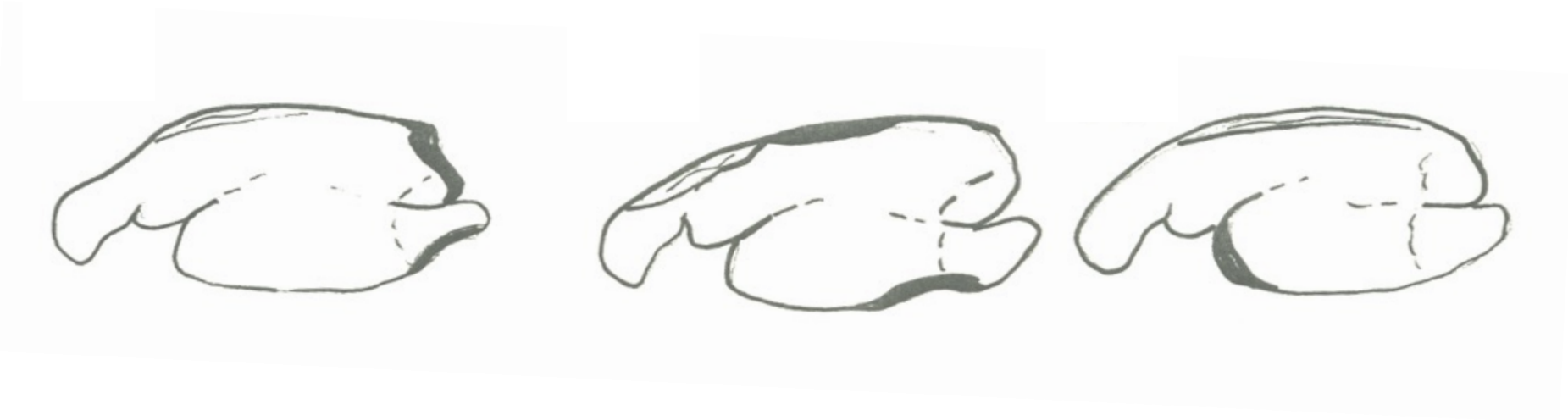
Types of ruminal contractions

- **Primary contraction**
  - **Also called A-wave or backward moving**

MIXING

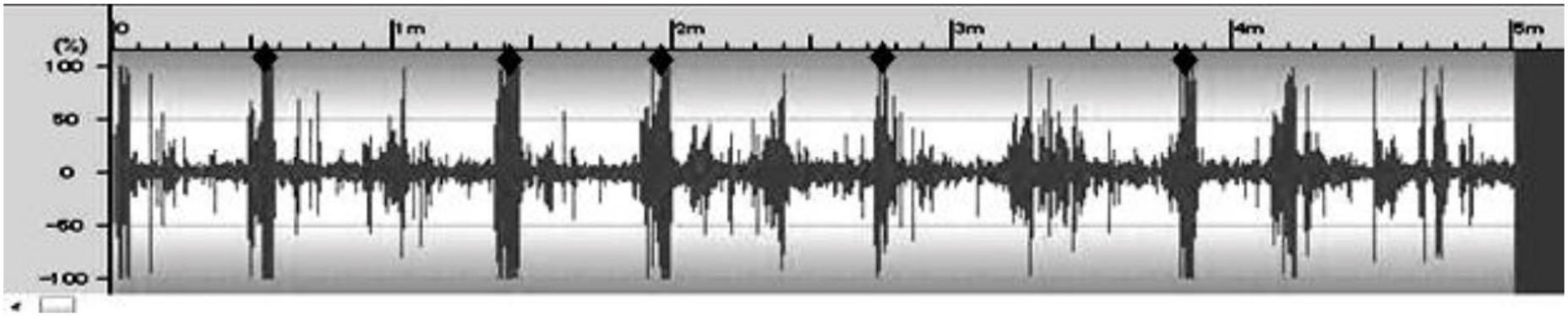
- **Secondary contraction**
  - **Also called the B-wave or forward-moving contraction**

ERUCTATION

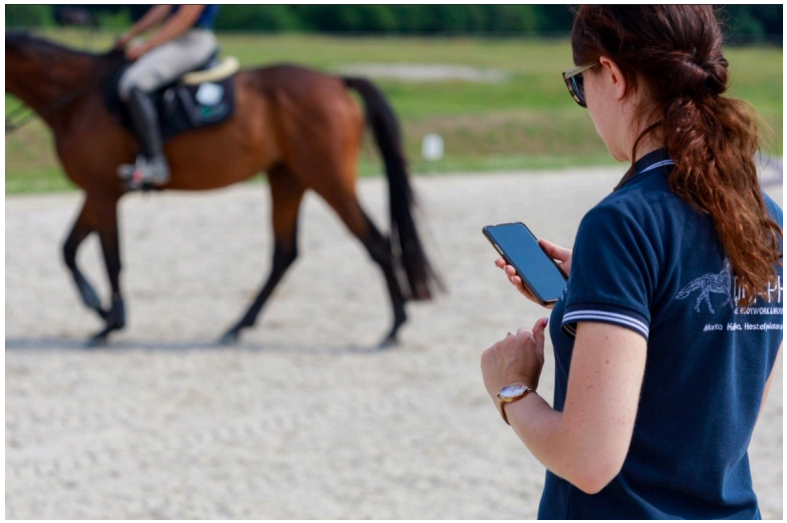


Gas	%
CO_2	65.35
CH_4 (variable)	27.76

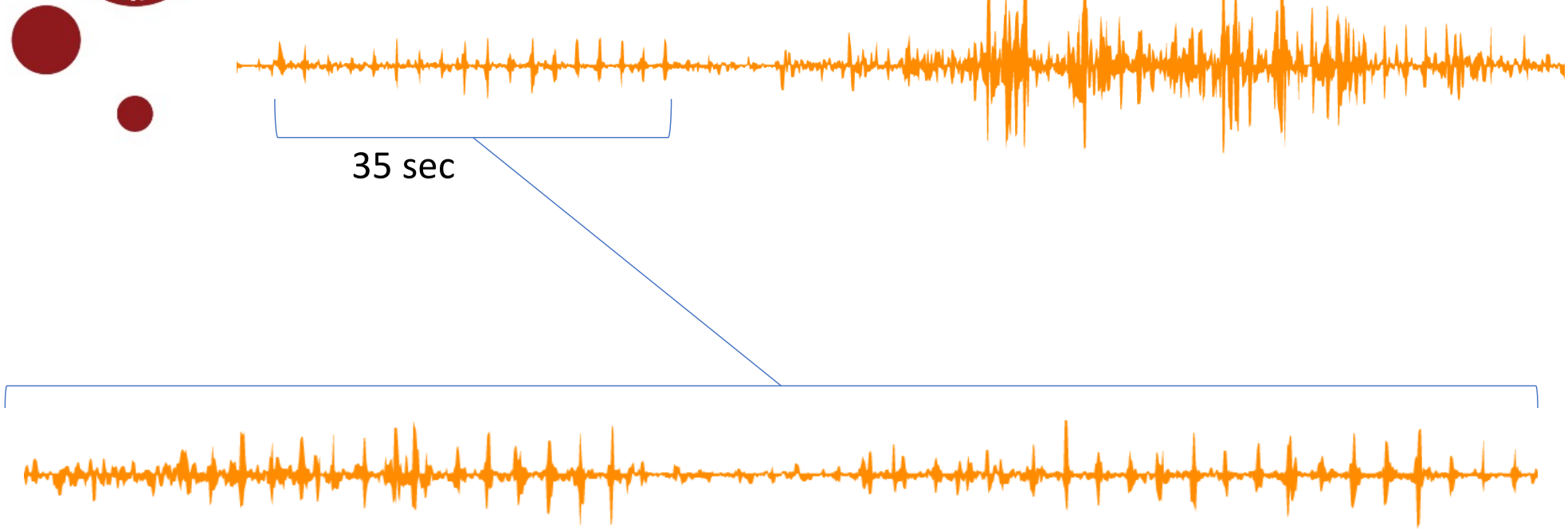
- **Gas production**
  - **Peak**
    - **Occurs 30 min to 2 hr post-feeding**
    - **12-27 l/min**



Wynn S, Teramura M, Sato T, Hanada M. Changes of serum calcium concentration, frequency of ruminal contraction and feed intake soon after parturition of dairy cows fed difructose anhydride III. Asian Australas. J. Anim. Sci. (2015) 28(1), 58-68



Vargas-Bello-Pérez, E.; Neves, A.L.A.; Harrison, A. A Non-Invasive Sound Technology to Monitor Rumen Contractions. *Animals* **2022**,*12*, 2164. https:// doi.org/10.3390/ani12172164



- Repeating regular patterns of contraction
- Low amplitude (weak contractions)
- Intermittent pauses

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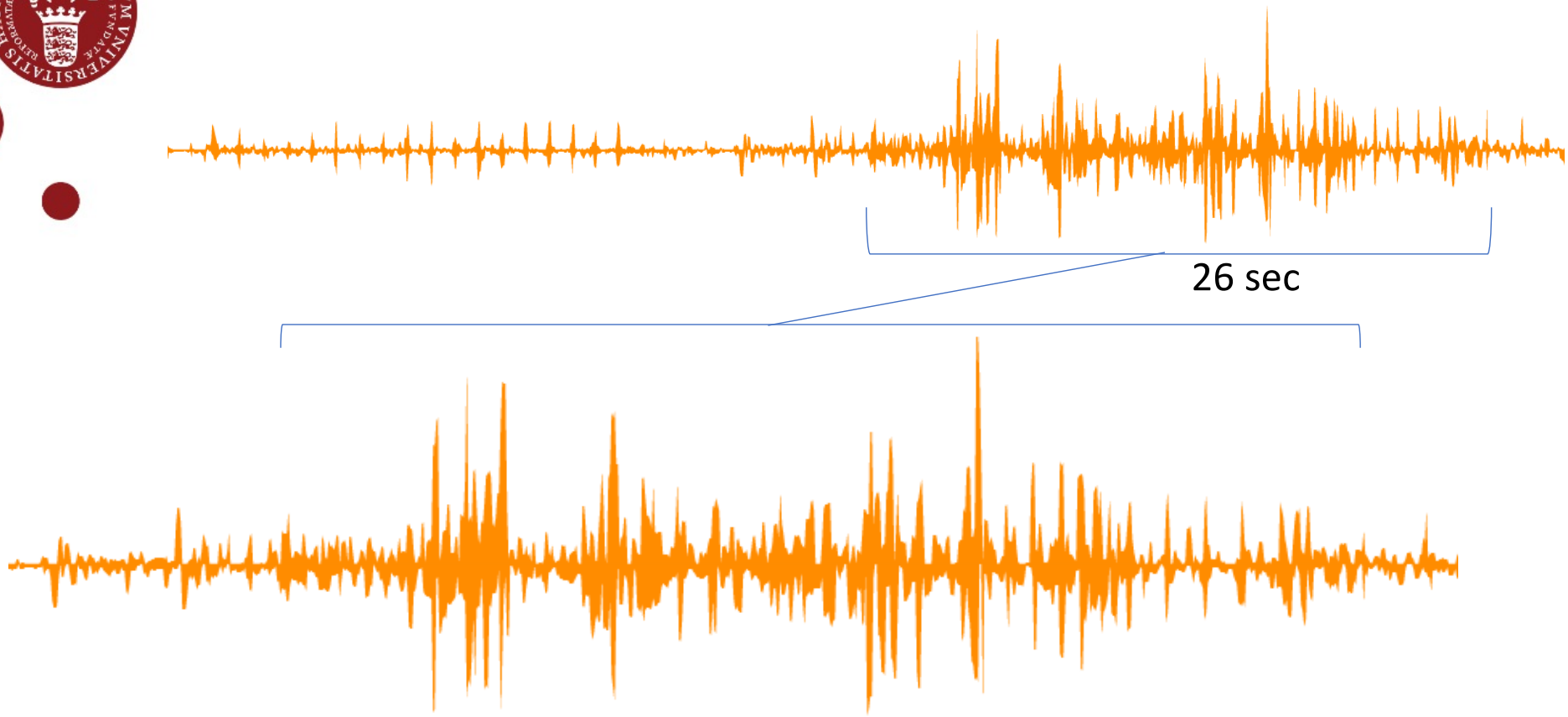
Primary Contractions in the Fed animal – 30 to 50 seconds duration



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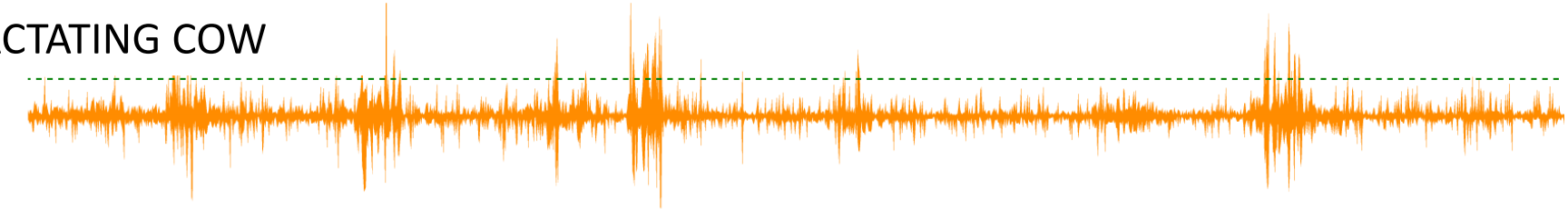
- Bursts of contraction
- High amplitude (strong contractions)

Secondary Contractions – 30 seconds duration

ESTi™ Analysis - Assendrup

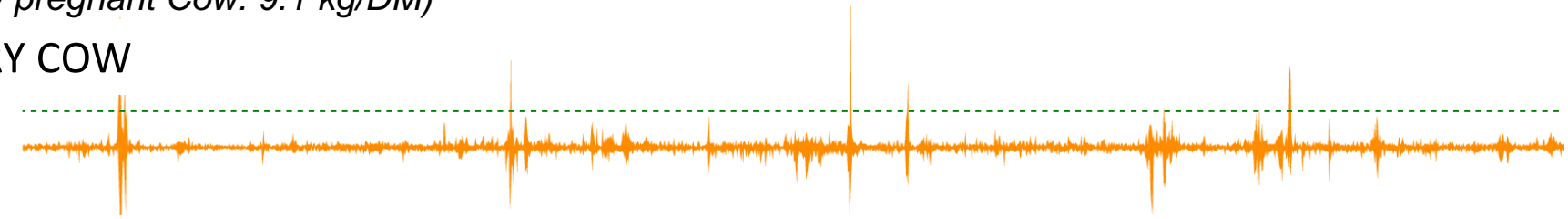
(High yielding Cow with 100 days of lactation: 21.4 kg/DM)

LACTATING COW



(Dry pregnant Cow: 9.1 kg/DM)

DRY COW



- Note – how easily these two cows/production levels can be identified based solely on their rumen sounds

LACTATING COW

DRY COW

CONCLUSONS

- It is possible to recorded high-quality rumen sound waves that differentiate rumen contractions between cows of different production statuses (dry cow vs. lactating cow)

- We envision the use of rumen sound recordings to detect the onset of metabolic diseases, such as acidosis and hypocalcemia

- We envisage the combined use of these CURO units alongside measurements of ruminant gas production;
  1) as a means of identifying animals with a high gas production, and
  2) as a means of monitoring the efficacy of compounds aimed at reducing ruminant gas production globally.

Thank You for Listening