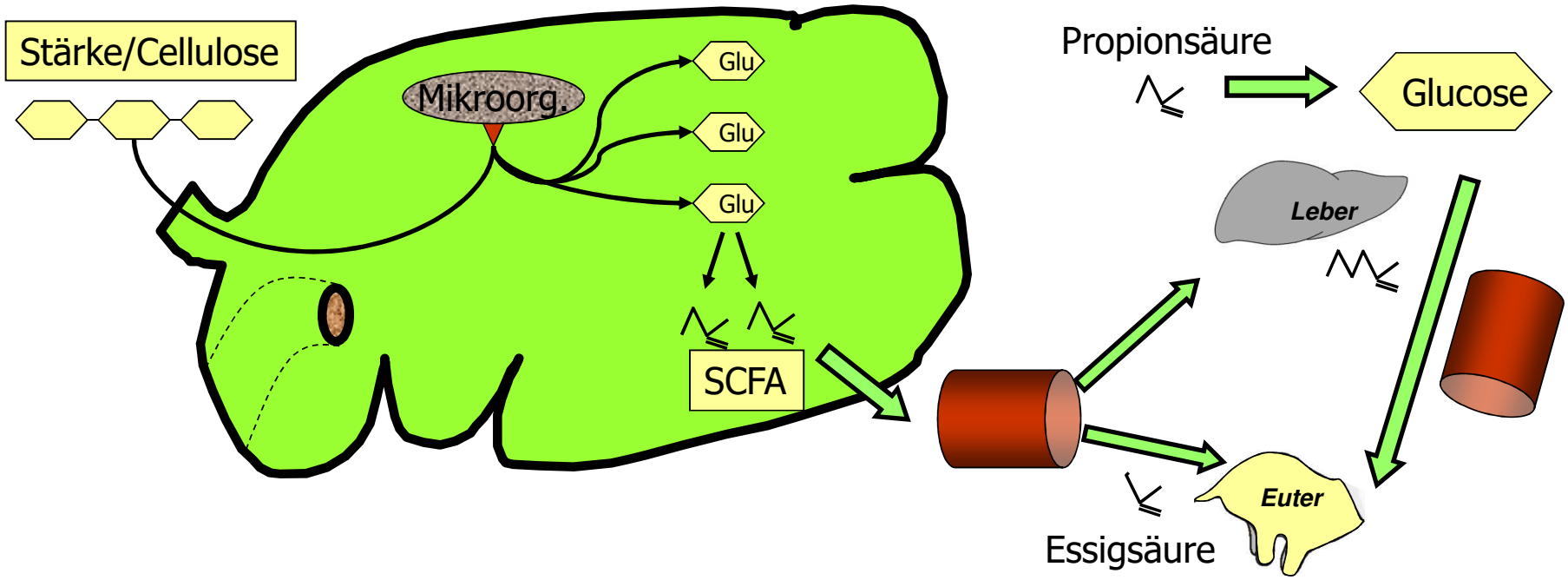
Der Pansen im Grenzbereich

170 MJ / Tag
~24 kg TM

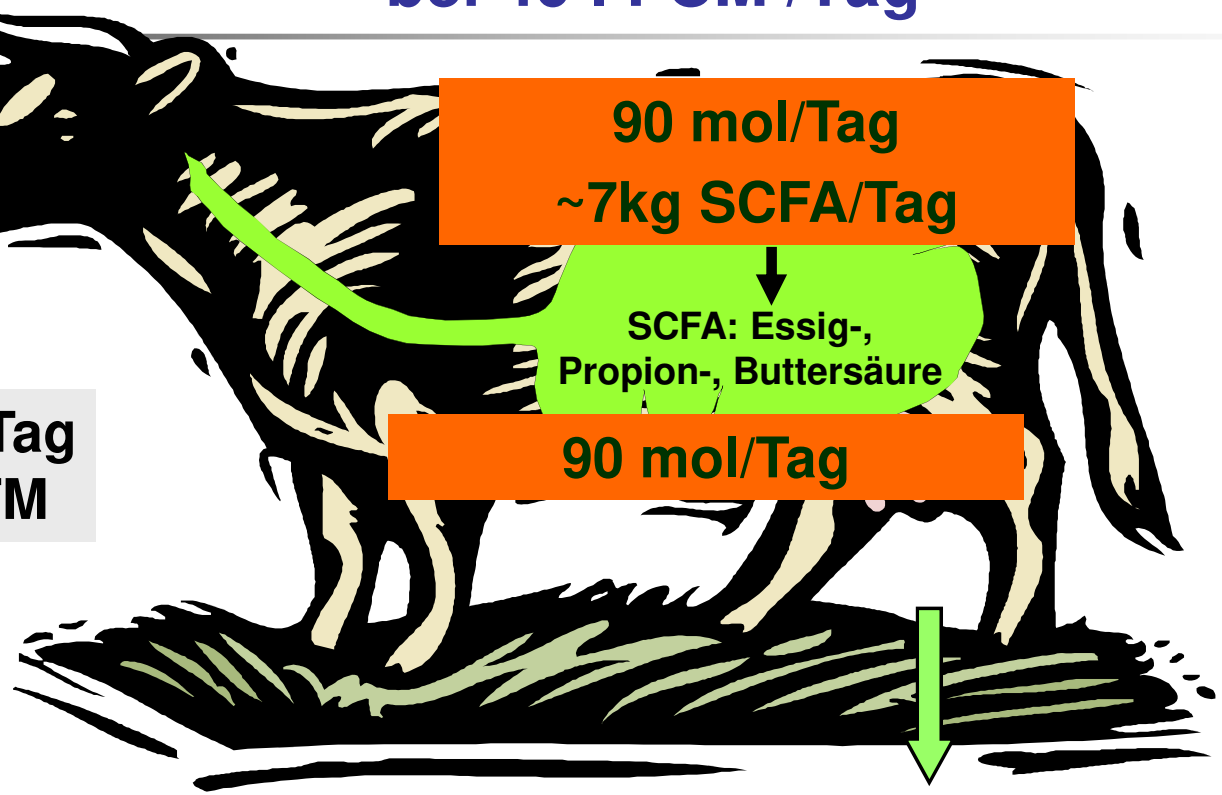
~1,6 kg Fett
~1,8 kg Laktose

Kohlenhydratverdauung



SCFA = **s**hort **c**hain **f**atty **a**cids: Essigsäure >> > Propionsäure > Buttersäure

SCFA-Produktion im Pansen bei 40 l FCM /Tag



90 mol/Tag
~7kg SCFA/Tag

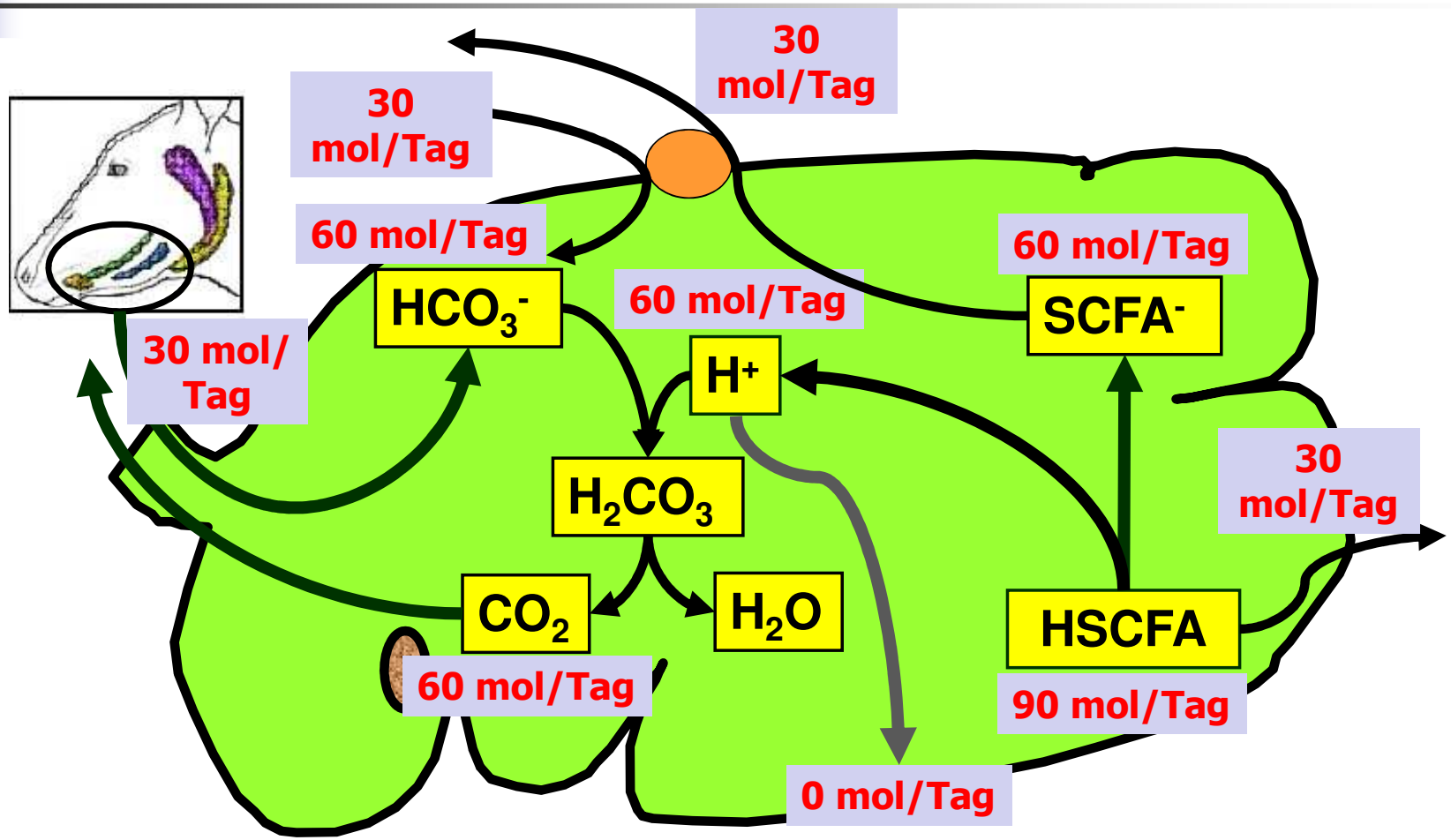
SCFA: Essig-, Propion-, Buttersäure

90 mol/Tag

170 MJ / Tag
~24 kg TM

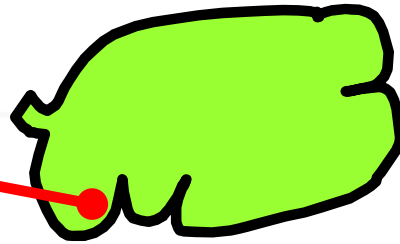
Allen 1997; Martin et al. 2001; Sutton et al. 2003; Loncke et al. 2009;Penner et al. 2009; Dieho et al. 2016

Protonenelimination: Gesamtkalkulation

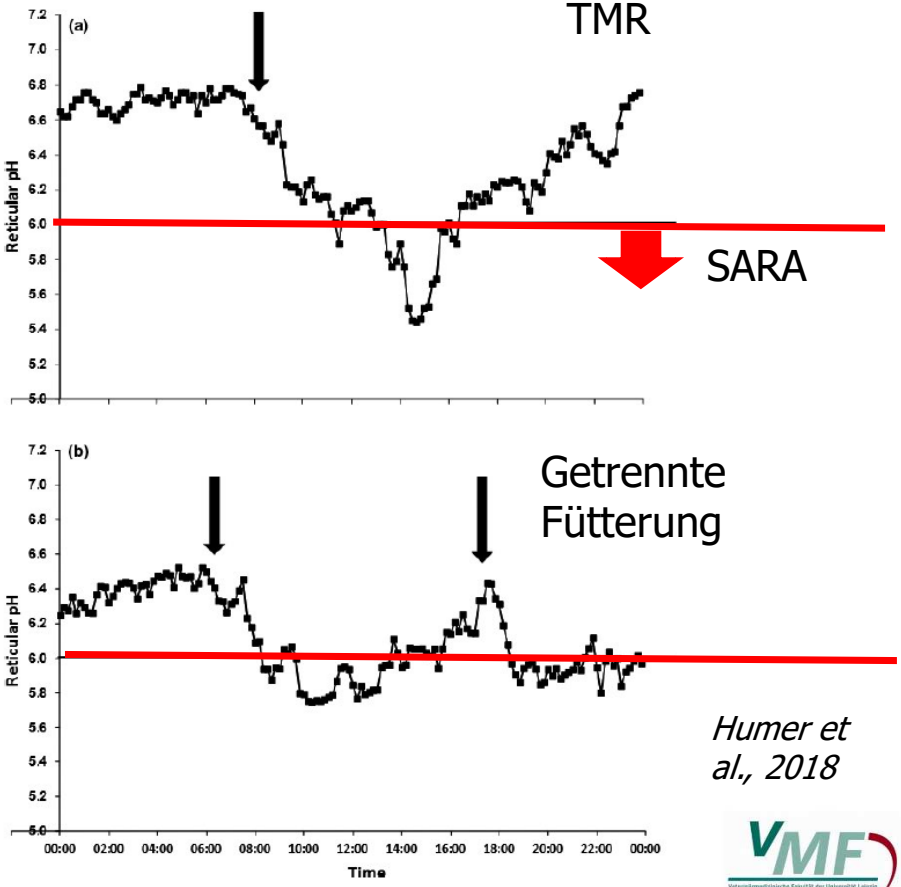


Gäbel et al. 1991, Allen et al. 2000, Martin et al. 2001, Resende Júnior et al. 2006, Penner et al. 2009, Aschenbach et al. 2011, Dieho et al. 2016

SARA: Definition über pH-Wert



- **SARA: Subakute = subklinische = latente Pansenazidose**
  - **SCFA ↑↑↑**
  - **pH ↓↓↓**
  - **Toxine/CLA ↑↑↑**
- **Pansen pH: Versuche einer Definition für SARA**
  - **pH <5,5/<6,0 (Pansen/Netzmagen)**
  - **Mehrere Stunden pro Tag und/oder**
  - **Mehrfach am Tag**



Humer et al., 2018

Pansensensoren

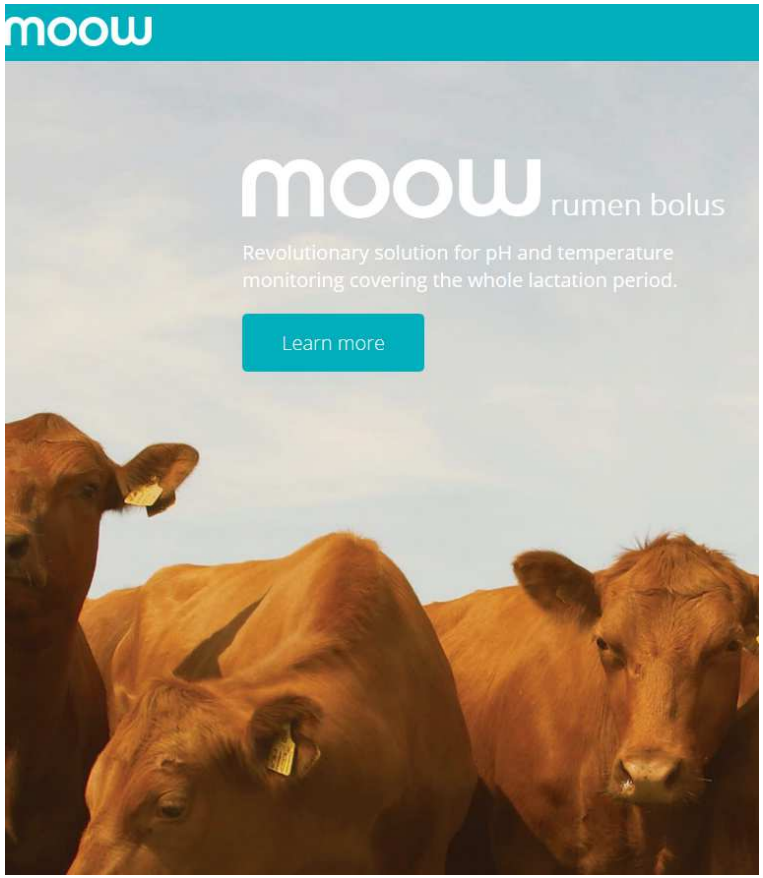
SMAXTEC PH PLUS BOLUS

Here you'll learn you to initialise, calibrate and administer the smaXtec pH Plus Bolus correctly.

The smaXtec pH Plus Bolus comes with state of the art sensor technology. This is the only way to ensure reliable pH measurement in the harsh environment of the rumen over an extended period of time. The smaXtec pH Plus Bolus measures the following parameters:

- rumen pH
- temperature
- activity levels

The measurement data is stored in the smaXtec pH Plus Bolus and automatically transmitted to the smaXtec Base Station or smaXtec Repeater via a radio system. The current dimensions of the smaXtec pH Plus Bolus mean it is not suitable for use in cows under the age of 18 months or weighing less than 450 kilos.

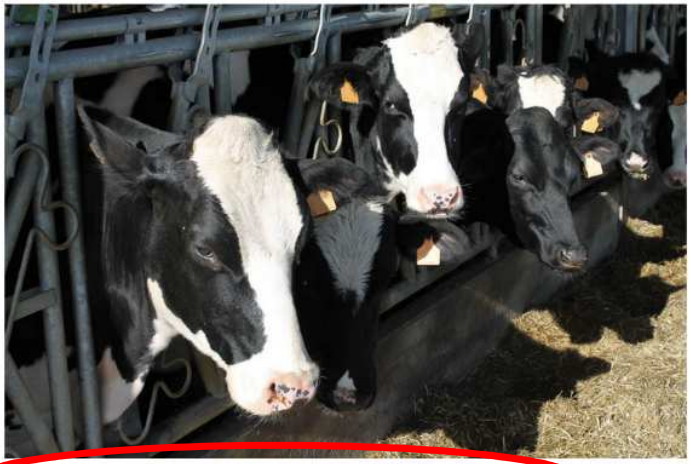


Pansensensoren: Redoxpotential

RAISING LIFE

Latest trends in Animal Nutrition & Health by Phileo

HOME RUMINANT SWINE POULTRY FISH & SHRIMP COMPANY



UPGRADE RUMEN REDOX STATUS FOR FEED EFFICIENCY IN DAIRY COWS

By Valentin Nenov on February 15, 2016

An important role of dairy cow nutrition is to maintain optimal conditions in the rumen for the bacteria required for efficient nutrient digestion. Dietary manipulation of the ruminal conditions will help to positively control the composition of the rumen microflora and hence it's function.

Importance of rumen microbial balance

DASCOR™

HOME Products & Services Projects

PRODUCTS & SERVICES

The sensor suite currently includes:

pH	(Consumable, Standard)
NH4+	(Consumable, Optional)
Temperature	(Permanent, Standard)
ORP/REDOX	(Permanent, Standard)

Redoxreaktionen: Elektronenaustausch

Metalle:

Oxidation: $Fe \rightarrow Fe^{2+} + 2e^-$
Das Metall Eisen gibt 2 Elektronen ab.

Reduktion: $O + 2e^- \rightarrow O^{2-}$
Sauerstoff nimmt 2 Elektronen auf.

Redox: $Fe + O \rightarrow Fe^{2+} + O^{2-}$
Sauerstoff oxidiert Eisen und wird selber reduziert

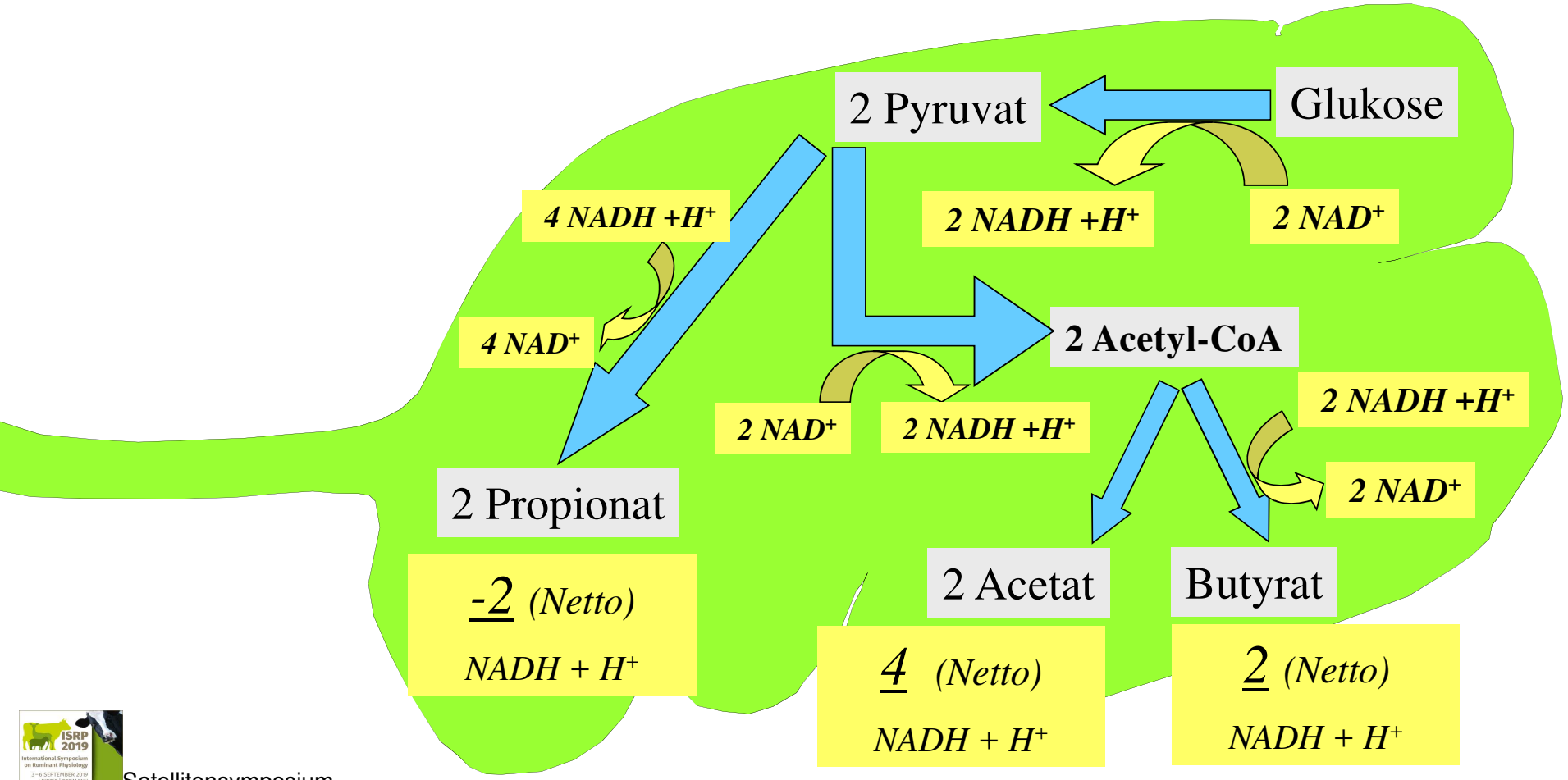
Wasserstoff als Reduktionsmittel:

Redox: $(2)H_2 + O_2 \rightarrow (2)H_2O$
Redoxpotential (E^0) H_2 : -413 mV /bei pH 7

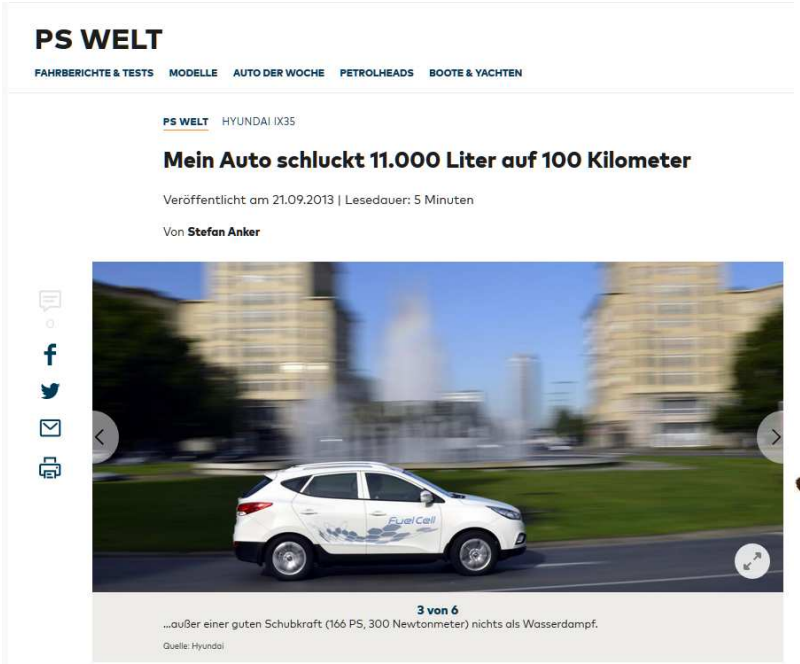
Coenzyme zur Minderung der Reaktionsgeschwindigkeit von Wasserstoff:

$(2)NADH+H^+ + O_2 \rightarrow (2)H_2O$
Redoxpotential (E^0) NADH + H^+: -320 mV /bei pH 7

Kohlenhydratverdauung: H_2-Bilanz

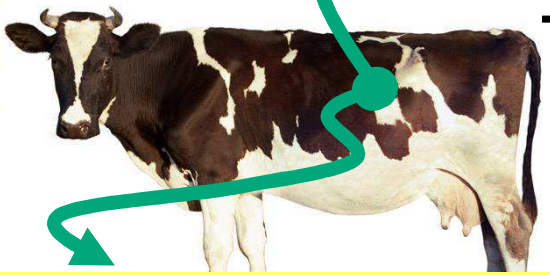


H_2 als Energieträger



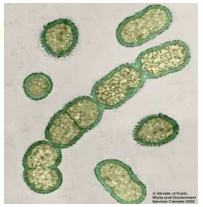
~9 km/Tag

$(2)H_2 + O_2 \rightarrow (2)H_2O$

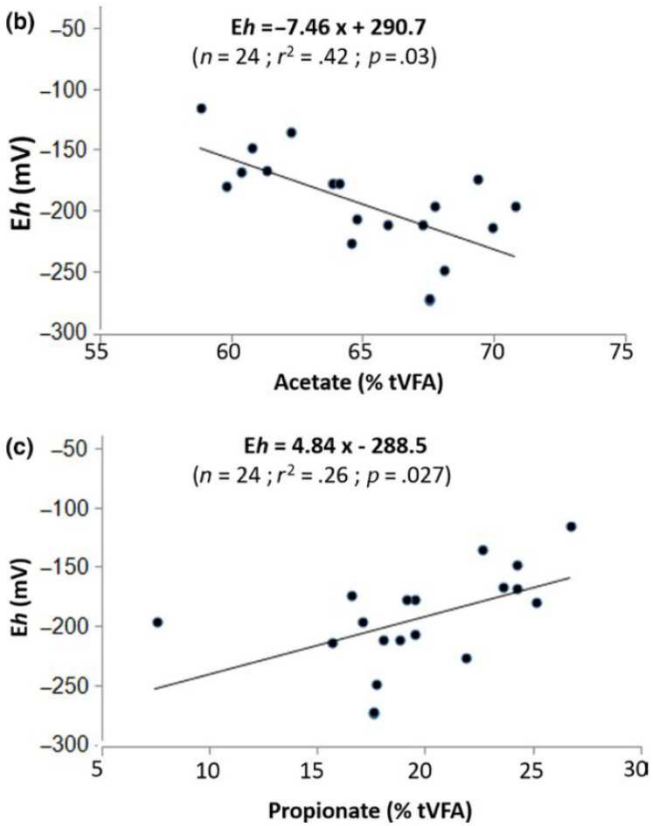


~1000 l H_2 pro Tag
(an NAD^+ gebunden)

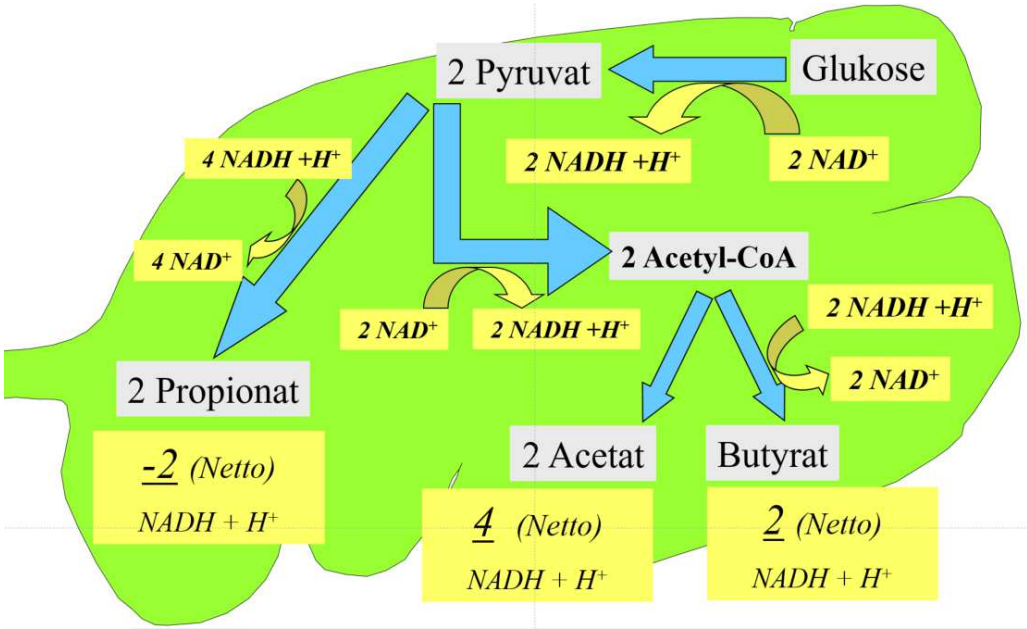
$$4\,(NADH + H^+) + CO_2 = 4NAD+ + CH_4 + 2\,H_2O$$



Redoxpotential und SCFA-Produktion

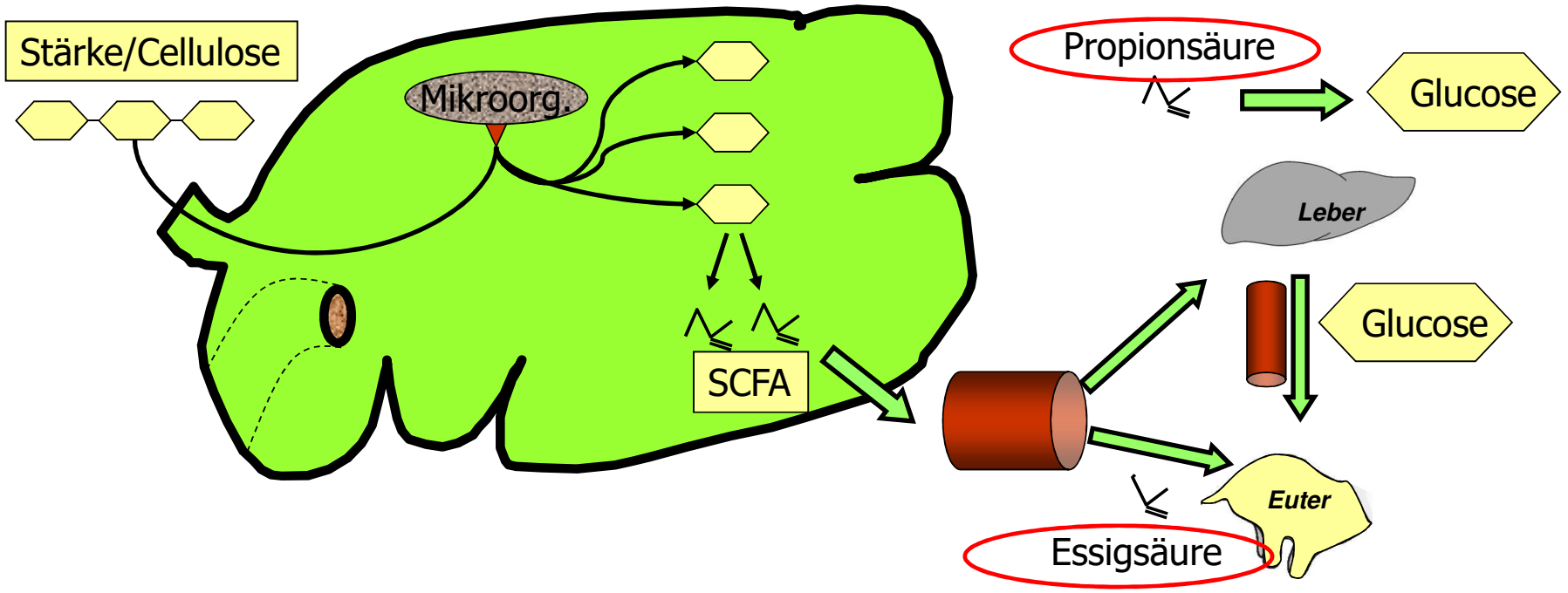


(Huang et al. 2018, Metaanalyse)



Redoxpotential (E^0) NADH + H^+: -320 mV /bei pH 7

Kohlenhydratverdauung



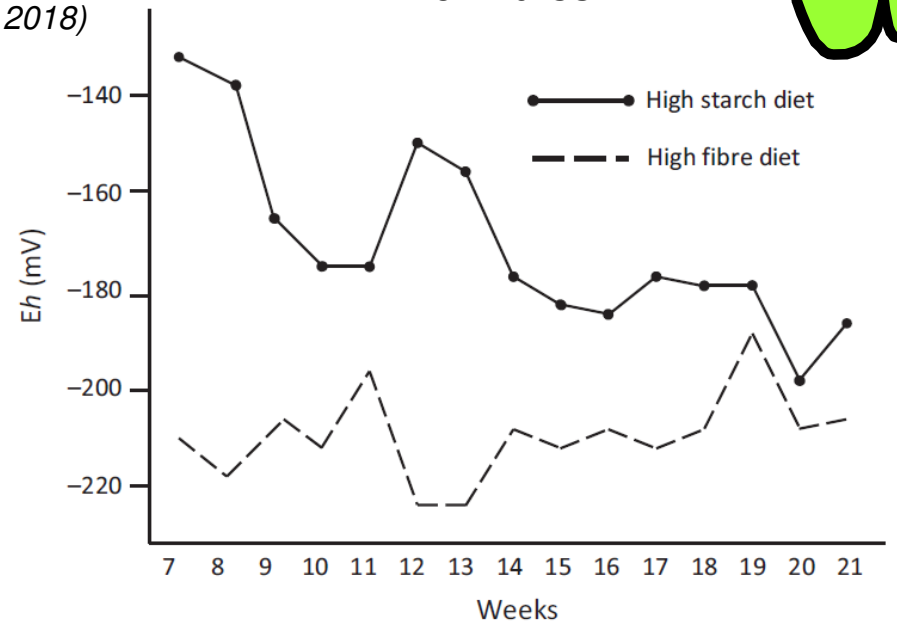
SCFA = **s**hort **c**hain **f**atty **a**cids: Essigsäure >> > Propionsäure > Buttersäure

Redoxpotential und bakterielle Aktivität

- E^0 ↓ →
  - **Fibrolyse** ↑
  - **Cellulolyse** ↑

(Pinloche et al. 2013; Huang et al. 2018)

Redoxpotential im Pansen von Färsen



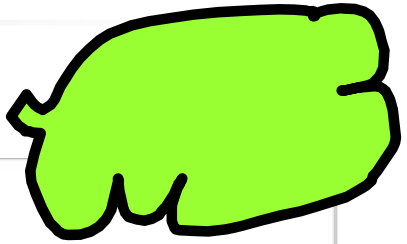
(Monteils et al. 2009)

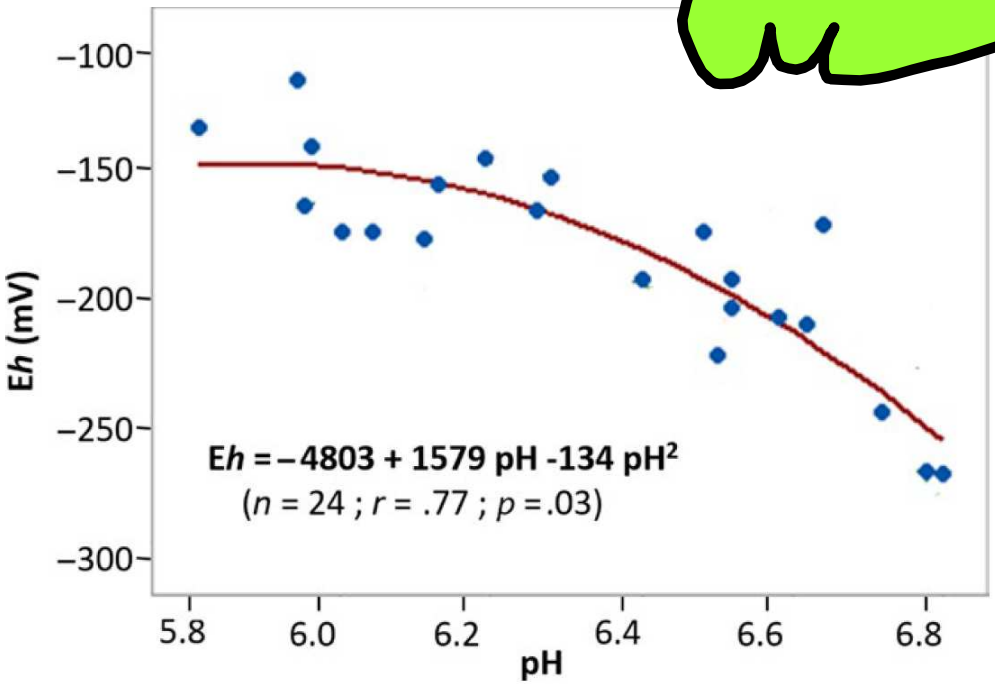
Redoxpotential und pH-Wert

Wässrige Lösungen 

Red/Ox	n	E^o in V bei pH 0	$E^{o'}$ in V bei pH 7
$NADH,H^+ / NAD^+, 2H^+$	2	+0,09	−0,32

(Wikipedia, 2019)

Pansen 



(Huang et al. 2018, Metaanalyse)

Schlussfolgerungen