Introduction
Why Do Nutritionists Care about BCS?

Anticipation of next calving and lactation

High early lactation needs
Introduction
Why Do Nutritionists Care about BCS?

Body fat balance

- Good fertility
- High milk production
- Health
Is There a Target Lactation BCS? The Cow Would Say « Yes »

Target BCS: BCS the cows will try to reach somewhere around 10-20 weeks of lactation

- If management pushes cows away → nutrient partitioning will restore to target BCS
- Genetically determined “set point”
- Has been decreasing with genetic selection for high milk yield and composition
- Allows to optimize production, reproduction and health
No Matter BCS at Calving, Cows Will Get Back to Their « Target » BCS

Fat cows: **Loose** more BCS
Thin cows: **Gain** BCS in early lact

At week 16, thin cows had **higher** DMI and Production than fat cows

Garnsworthy (2007), Drackley (2016)
Use of BCS for Herd Nutrition and Management

↑ BCS during the dry period
• Internal fat, insulin resistance, fatty liver, dystocia... extreme BCS loss in early lactation, poor production and poor fertility

↓ BCS during the dry period
• Negative impacts on calf growth, survival and future performance; cow → poor production

+ BCS at calving
• Lower DMI, excessive mobilization, increased risks or disease and poor fertility

− BCS at calving
• Lower immunity, anestrue, risk of lower milk yield

For better sustainability, all these should be avoided
Use of BCS for Herd Nutrition and Management

**TO DO SO:**
Monitor BCS regularly (Cow or Pen Level)

**TO GET THERE:**
Adjust ration to maintain/meet optimal BCS

**GOAL:**
Maximize performance and Avoid problem cows
Use of BCS for Herd Nutrition and Management

Aim for BCS at calving around 3.0-3.25 (Cows) and 3.25-3.5 (Heifers)

Aim for the target BCS in mid-late lactation (200 DIM)

Aim for a 0.5 point variation in BCS in early lactation
  • The other way around: Aim for a BCS at calving that would be 0.5 above the « target » BCS at 100 DIM

Δ BCS
Inter-Observer Variation

73 cows, 28d interval for BCS scoring

$BCS_1 = \text{Week 1-3} \quad BCS_2 = \text{Week 6-8}$
Inter-Observer Variation

Single BCS Evaluations:
BCS₁ \( K_w = 0.79 \) (95%CI: 0.69-0.85)
BCS₂ \( K_w = 0.84 \) (95%CI: 0.77-0.89)

\( K_w \) = weighted Kappa

Morin et al., 2017
Inter-Observer Variation

**Single BCS Evaluations:**

\[
\text{BCS}_1 K_w = 0.79 \ (95\% \text{CI}: 0.69-0.85) \\
\text{BCS}_2 K_w = 0.84 \ (95\% \text{CI}: 0.77-0.89)
\]

\( K_w \) = weighted Kappa

**Δ BCS Evaluations:**

\[
\Delta \text{BCS} K_w = 0.49 \ (95\% \text{CI}: 0.32-0.63)
\]

**Conclusions:**

- Single BCS measures: multiple observers would provide high accuracy
- Δ BCS measures: single observer for reliable results

Morin et al., 2017
Our Lactanet Dataset
3.4 M BCS Values in Last 20 Years

Year

N of BCS Records
0 50000 100000 150000 200000 250000 300000

2008: 287k
2021: 3k
Less Individual Cow Assessments
Same N/Cow (Covid)
Pen Level Assessments

Nutritional requirement: Feed a group of cows

BCS assessment: Group of cows (Ex: X% of pen; random X cows)

Data no longer entered on a « cow basis »
(Group BCS kept in records but not linked to individual animals)

As farms get bigger, this challenge to get access to data will increase

We feed Groups of cows, and manage exceptions
Food for thought

• BCS assessment is critical to adjust ration and avoid future problems, especially around calving/early lactation

• Current farm structures and management might limit the individual cow BCS assessment and recording

• Potential for automated systems:
  • High data frequency
  • Well suited for larger herds
  • Economics for small herds?
  • Monitoring of critical periods?