Marbling

Prime

Moderately Abundant  Slightly Abundant

Upper Choice, CAB

Choice-

Select

Moderate  Modest  Small

Slight
National Beef Quality Audits

2016 vs. 1993

- 64% Prime
- 75% Upper Choice (CAB)
- 35% Select
- 86% Standard

Choice

71% Choice
55% Choice
Why?

DISCOUNTS and premiums

Marbling $^2 = 0.48$
Carcass EPDs

Source: American Angus Association
Choice – Select Spread

$2 - $25/cwt differential

Avg. HCW = 879 lb

$18 - $220/car carcass loss

Graph taken from CAB Insider, May 2 2018
Premiums and Incentives

CAB (Upper Choice): $4-14/cwt premium

PRIME: $9-26/cwt premium
Current Market

Base Price: Ch YG 3 $202.60/cwt
Premiums:
Prime 1-3 $13.80/cwt
CAB 1-3 $5.28/cwt
YG 1 $3.86/cwt
Discounts:
Select $-13.65/cwt
Standard $-29.77/cwt
YG 4 $-11.21/cwt
Historical Model of Marbling Deposition

- Marbling:
  - Last to be deposited and First to be mobilized
Fig. 3. Number frequency distribution of adipose cells from bovine adipose tissue. HXA, Hereford X Angus animals, 14 months old and 470 kg live weight; Hereford animals, 8 months old and 215 kg live weight; LD, SM, PF, and TR refer to adipose cells from longissimus dorsi, semimembranosus, pectoralis profundus, and trapezius muscles, respectively. SQ and PERI refer to subcutaneous and perirenal adipose tissue, respectively.
Recent Models of Marbling Deposition

Du et al. 2015. Meat Sci. 40-47
# IMF Fractional Growth Rate

**Table 6.** Fractional growth rate at time and weight constant endpoints<sup>a,b</sup>

<table>
<thead>
<tr>
<th>Fractional growth&lt;sup&gt;b&lt;/sup&gt;</th>
<th>204 to 250 kg</th>
<th>250 to 295 kg</th>
<th>295 to 340 kg</th>
<th>340 to 386 kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein</td>
<td>0.34</td>
<td>0.26</td>
<td>0.20</td>
<td>0.15</td>
</tr>
<tr>
<td>Fat</td>
<td>0.85</td>
<td>0.72</td>
<td>0.62</td>
<td>0.54</td>
</tr>
<tr>
<td><strong>IMF</strong>&lt;sup&gt;c&lt;/sup&gt;</td>
<td><strong>1.04</strong></td>
<td><strong>0.71</strong></td>
<td><strong>0.54</strong></td>
<td><strong>0.44</strong></td>
</tr>
</tbody>
</table>

<sup>a</sup>Based on compositions predicted by regression equation predicting change in mass relative to hot carcass weight in Table 5.

<sup>b</sup>Percent per day.

<sup>c</sup>Intramuscular fat content of the 12th-rib face.

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Bruns et al. 2004. JAS 82:1315-22
Can we Accelerate Marbling Deposition?
Creep Feeding
Creep Feeding -

![Graph showing marbling scores with different feeding conditions.](image)

- Pasture
- Drylot, no creep
- Drylot, creep
- Control
- Limited creep (1kg/d)
- Unlimited creep
- Corn
- Soybean hulls

Marbling score, 500 = Small

- Deutscher/Slyter
- Faulkner

Superscript:
- a
- b
- c

Deutscher and Slyter, 1978, JAS 47:19-28. SD, 6 yr
Creep Feeding -

Myers et al. 1999. JAS 77:300-310. Illinois
Time of Weaning
Early vs. Normal Weaning

EW = 130 d
NW = 226 d
98 d dry lot period
220 d grazing period
Feedlot finishing

Wiseman et al. 2019. JAS 97:1198-1211
Metabolic Imprinting – Early Weaned Steers

Early weaned @ 105 d of age (MIP)
Normal weaned @ 253 d of age (NW)

MIP fed CONC d 105 to 253
NW and MIP were grouped and grazed for 156 d
NW and MIP were fed corn-silage based feedlot diet to 0.4 – 0.5 in of backfat

Marbling score, 500= small

Scheffler et al. (2014)
Diet or Animal Age?

- Is it exposure to high concentrate diets OR early weaning?
Changes in IMF across Time-on-Feed (TOF)

Duckett et al., 1993, JAS 71:2079
### Timing of Exposure to Concentrates (CONC)

<table>
<thead>
<tr>
<th>Phase 1: 0-111d</th>
<th>Phase 2: 97 d</th>
<th>Phase 3: to 1250 lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONC (n = 20)</td>
<td>FOR</td>
<td>CONC</td>
</tr>
<tr>
<td>NW and 30d</td>
<td></td>
<td>FOR-Conc</td>
</tr>
<tr>
<td>background</td>
<td></td>
<td>FOR</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FOR (n = 20)</th>
<th>CONC</th>
<th>FOR</th>
<th>CONC-Conc</th>
</tr>
</thead>
</table>

**CONC:**
- 25% corn silage
- 75% corn/sbm

**FOR:**
- Novel fescue
- Annual ryegrass
- Alfalfa
- Cowpea

Study 1: Percent Choice or CAB

% ≥Choice-
% >CAB
Angus steers (n = 20)
30-d background
Fed for 111 d

Study 3: Time on CONC

![Bar Chart]

- X-axis: Time (0, 40, 80, 120)
- Y-axis: %
- Categories: Choice, CAB

- Choice: 0, 0, 0, 0
- CAB: 0, 0, 0, 0
The proposed hypothesis for limited adipose tissue expandability. When the body is in a positive energy balance, the adipose tissue will expand to handle the excess energy. If the adipose tissue is not capable of expanding sufficiently, there will be a spillover of FFA to non-adipose tissue leading to harmful effects in liver, muscle and pancreas.

European Journal of Endocrinology 176, 2; 10.1530/EJE-16-0488
Conclusions

• Rethink our approach for calves with high marbling potential
• Marbling does not have to be a ‘LATE’ developing depot
• Feeding high concentrates **early** is important
  • Creep feeding may help
  • EW vs NW
    • exposure to concentrates early
  • Early deposition will persist during forage finishing
• More research needs to be done............