Cattle Growth Dynamics and Its Implications

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Maximize Weight Gain

Minimize Feed/Gain

Reach desirable level of finish

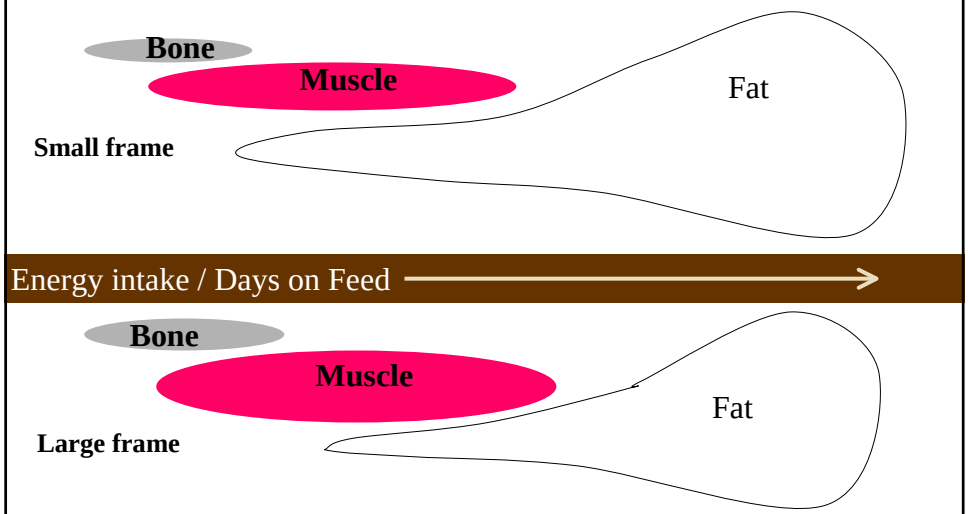
Minimize Discounts

Capture Premiums

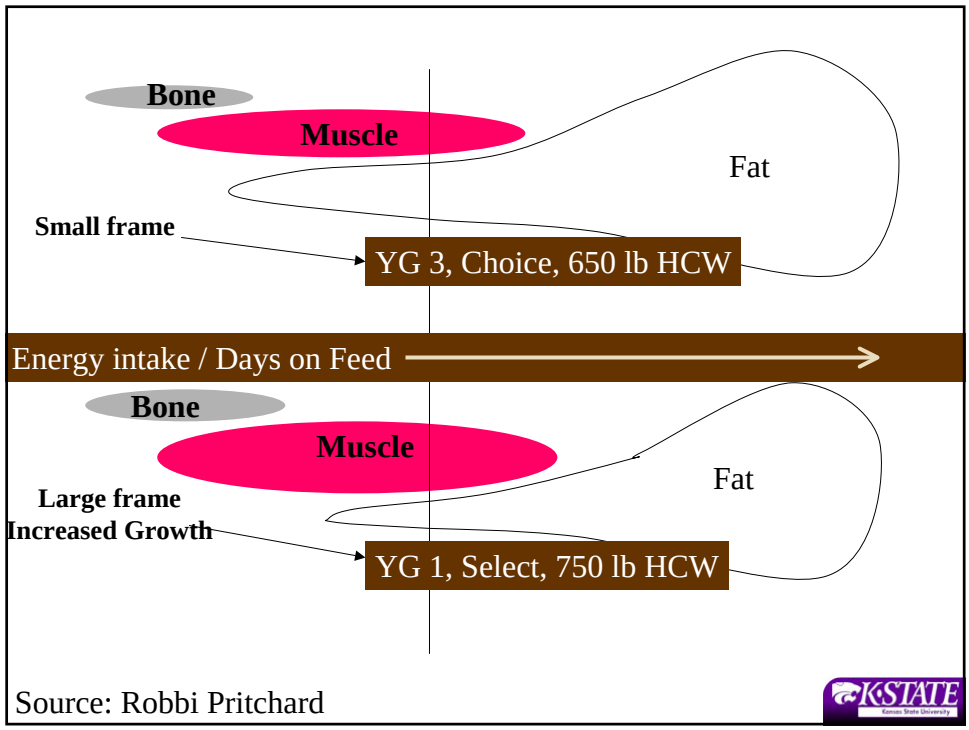
To manage these I must understand growth

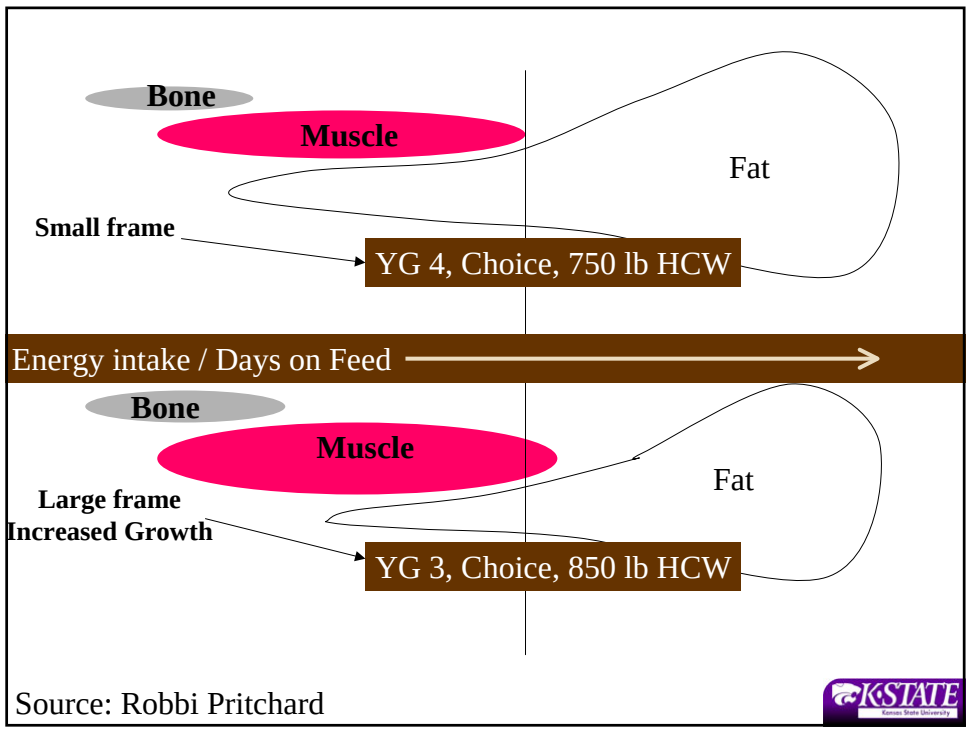
- **Body composition = protein + fat in the animal.**
- **Depends upon where the animal falls on its growth curve.**
- **Changing the growth curve: changes the weight at which an animals reaches a specific body composition.**

Growth Curve



Source: Robbi Pritchard


Bone
Muscle
Fat
Small frame
YG 3, Choice, 650 lb HCW
Energy intake / Days on Feed
Bone
Muscle
Fat
Large frame
Increased Growth
YG 1, Select, 750 lb HCW
Source: Robbi Pritchard


Bone
Muscle
Fat
Small frame
YG 4, Choice, 750 lb HCW
Energy intake / Days on Feed
Bone
Muscle
Fat
Large frame
Increased Growth
YG 3, Choice, 850 lb HCW
Source: Robbi Pritchard

Can they have equal fatness? Yes

Will they weigh the same at equal fatness?

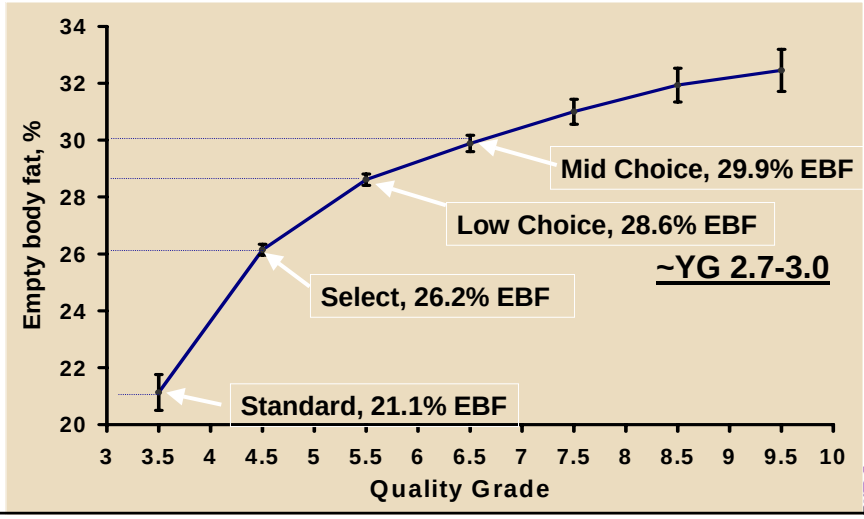
No

Will they have similar grade at equal fatness?

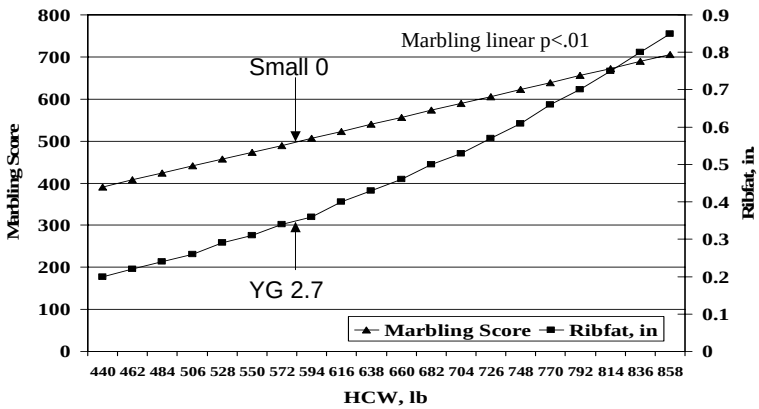
???

- **Weight at a target fat endpoint**
  - **Not a common time endpoint**
- **Animals need to reach a certain level of fatness to marble.**

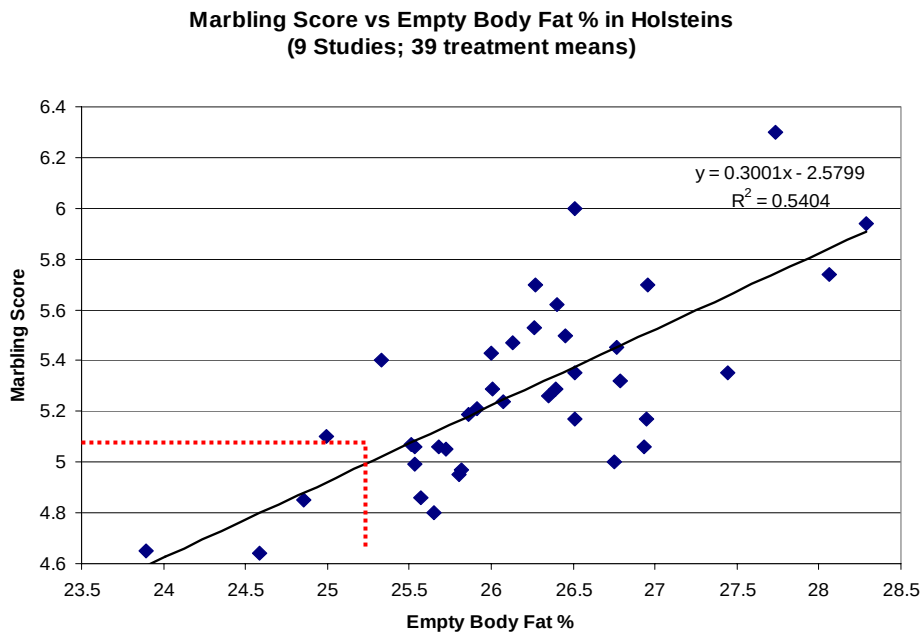
Relationship of body fat to marbling
(Guiroy, 2001, total of 1,355 animals)



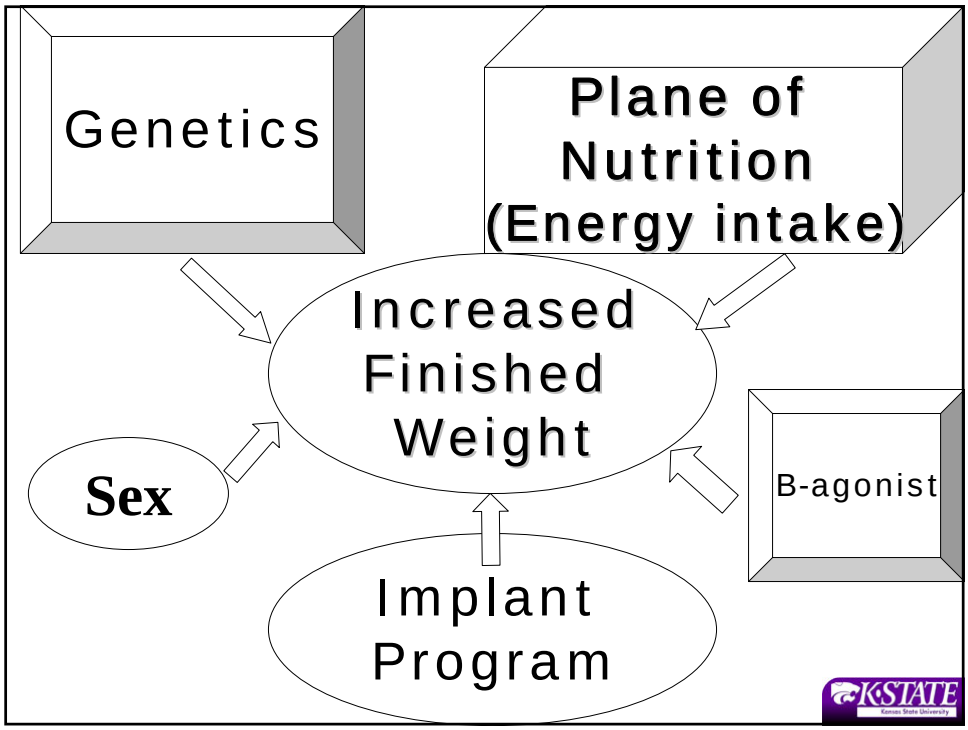
Relationship between Marbling and Backfat with Carcass Weight



Bruns et al., 2000



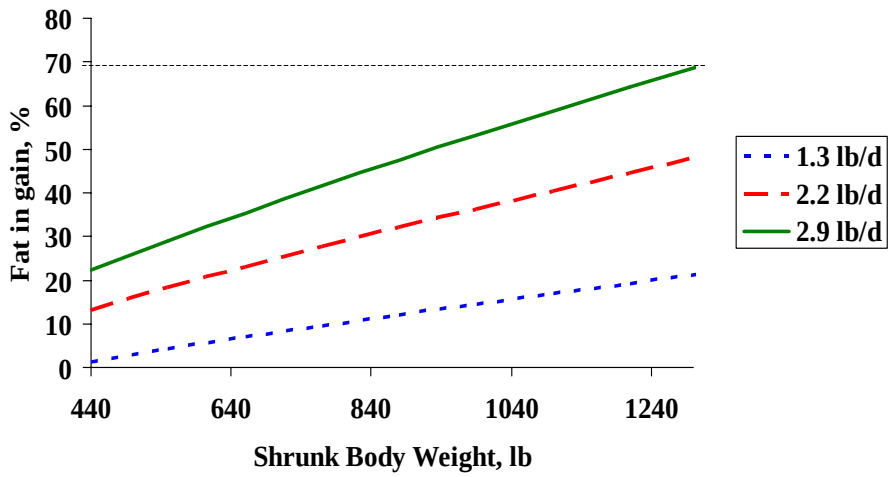
- **Allowing cattle to reach a particular fatness will allow the animal to express its genetic potential to marble.**
- **Marbling is linear and increases with increasing hot carcass weight.**
- **Changes in the growth curve will change the weight at which an animal reaches a target level of marbling (fat).**



Frame Size x Weight (lb) at <u>equal fatness (29% fat)</u>

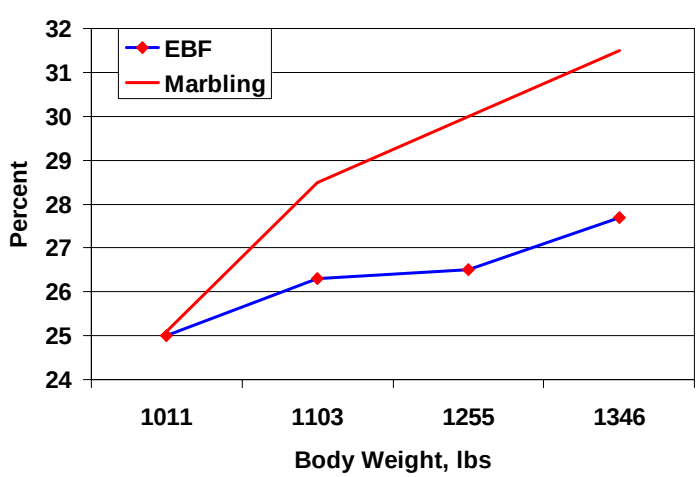
	Frame Score			
	5	6	7	8
Steer	1175	1250	1322	1395
Heifer	939	1001	1058	1115

Effect of Rates of gain vs. Fat in gain



Effects of Body Weight on Holsteins

Proceedings: Cornell Holstein Beef Symposium 1986
U. Of MN, 612 lb in wt; Ralgro



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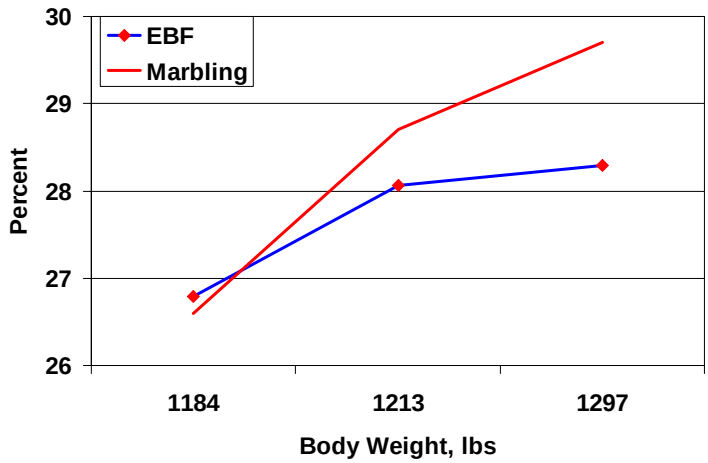
Effects of Body Weight on Holsteins

Penn. State, 2001; 404 in wt. 247-332 dof



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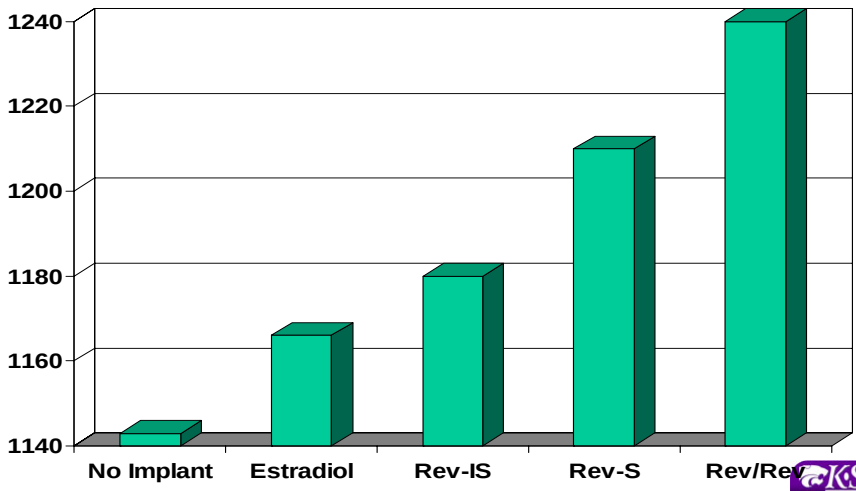
Implants and The Growth Curve

- **Do implants change weight at equal fatness?**
- **Do implants change the amount of fat required to reach Choice?**

Cornell Database Evaluation

- 13 implant trials,
- 13,640 total animals
  - 9,052 steers; 4,588 heifers
- 15 different implant strategies
- Reimplanting 64-90 days on feed.
- Individual carcass data measurements
  - used to calculate finished weight at 29% empty body fat.

Implant Strategies and Weight at Equal Fatness

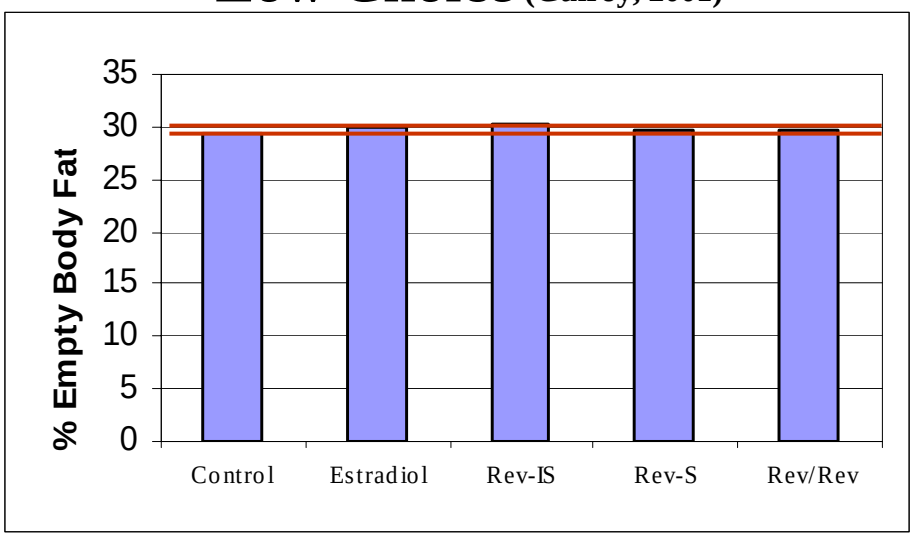


Implants and Fatness

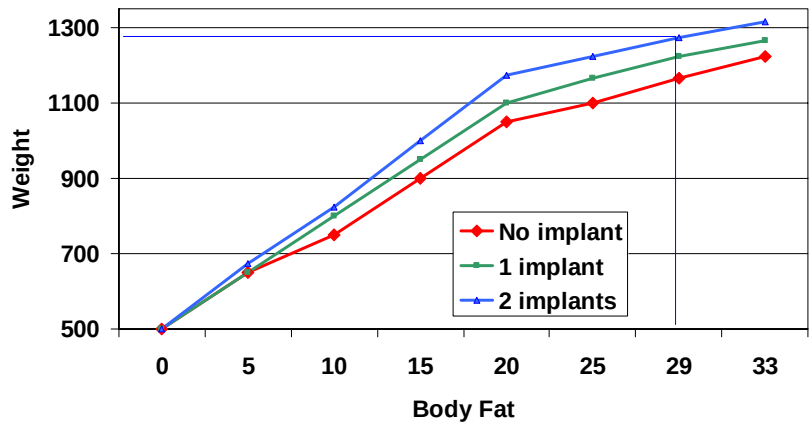
Implants <u>DO</u> change wt at 29% body fat,

But do implants change <u>Percent Choice</u> at 29% Body fat?

Fat Content of Steers Grading Low Choice (Guiroy, 2001)

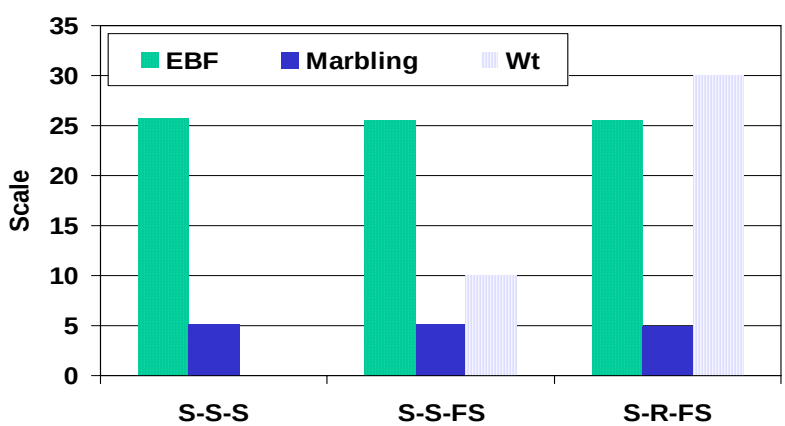


Growth Curve Modification by Implants



Effects of Implants on Holsteins

KSU 1993; 378 in wt. 252 dof



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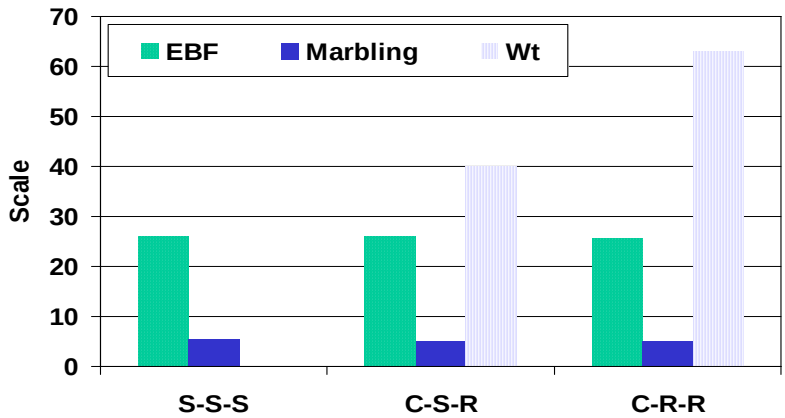
Effects of Implants on Holsteins

KSU, 1998; 308 lbs.; 326-350 dof



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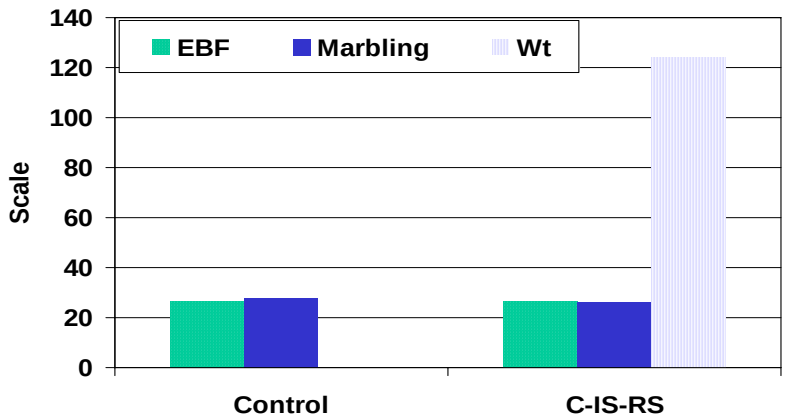
Effects of Implants on Holsteins

Cal Poly, 2000; 319 in wt. 291 dof



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Implants and Finished Weight

- Implants increase the growth curve
- Increasing dose increases weight at a common body fatness.
- Different implant programs in time constant trials can be misleading.
- Compare cattle of = fatness if evaluating grade differences.
- Implants do not change the amount of fat required to reach Choice.

Questions?

Conclusion

- Use technology to your advantage.
- Animals need to reach a certain fatness to marble.
- Relationship between Quality grade vs. Yield grade:
  - Exploit it to your advantage.

Thank You!