What do we know about developing heifers in a drylot?

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How does this fit with what we have heard already today?

- **Developmental programming**
- **Not everything we do has just an immediate response**
- **What are the long-term implications of how we develop replacement heifers?**
- **Assisted reproductive technologies can be “easier” in a drylot.**

Economics

- **Heifers developed in a dry lot do not have a successful return on investment**
- **Cost more and have decreased returns compared to heifers developed on pasture.**
  - **Price of pasture trending upward**

Item	Treatment[1]		
	36RUP	50RUP	DRYLOT
Gross returns, $			
Nonpregnant heifers	6,576.96	3,214.08	8,799.04
Pregnant heifers	77,890.56	83,201.28	74,350.08
Total	84,467.52	86,415.36	83,149.12
Costs, $			
Heifer purchase cost	50,264.00	50,264.00	50,264.00
Developing ranch heifers			
Grazing	4,419.00	4,419.00	
Supplement	3,561.60	4,256.00	
Mineral and salt	620.00	620.00	
Developing feedlot heifers			
Freight			600.00
Feed			12,600.00
Yardage			2,800.00
Total	58,864.60	59,559.00	66,264.00
Net returns, $	25,602.92	26,856.36	16,885.12
Net returns, $/heifer developed	256.03	268.56	168.85

[1]36RUP = 36% CP cottonseed meal base supplement fed 3 d/wk supplying 36% RUP; 50RUP = 36% CP supplement fed 3 d/wk supplying 50% RUP; DRYLOT = corn silage diet fed in drylot to gain 0.68 kg/d.

Mulliniks et al. 2013. J. Anim. Sci. 91:1409

Reproductive management

- **Easier access for assisted reproductive technologies**
  - **Detection of estrus**
  - **Reproductive tract scoring**
  - **Synchronization of estrus**
  - **Artificial insemination**

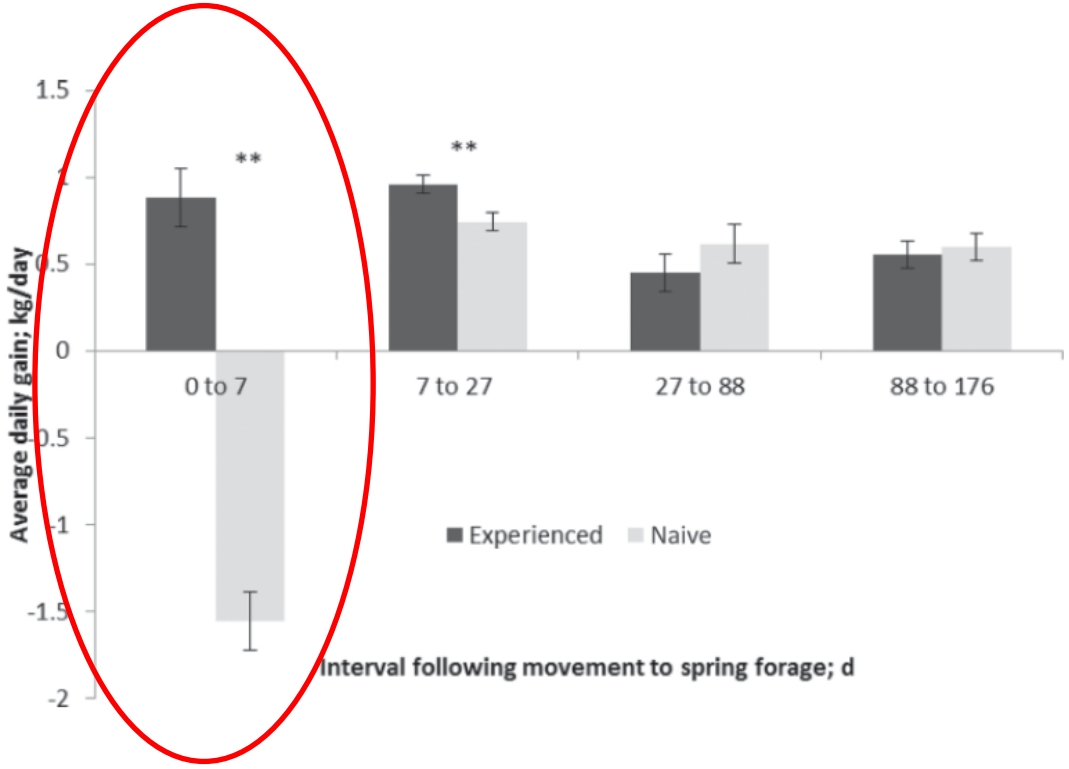
Behavioral changes

- **Heifers that are raised in a drylot and then moved to pasture have decreased body weights in the first month compared to heifers developed on range.**

- **Decreased body weight is due to the need for heifers to learn grazing behavior.**

Grazing is a learned behavior

- **Heifers that were artificially inseminated in the drylot and then moved to forage had decreased pregnancy to timed artificial insemination.**
  - **49.1% vs 59.4%**

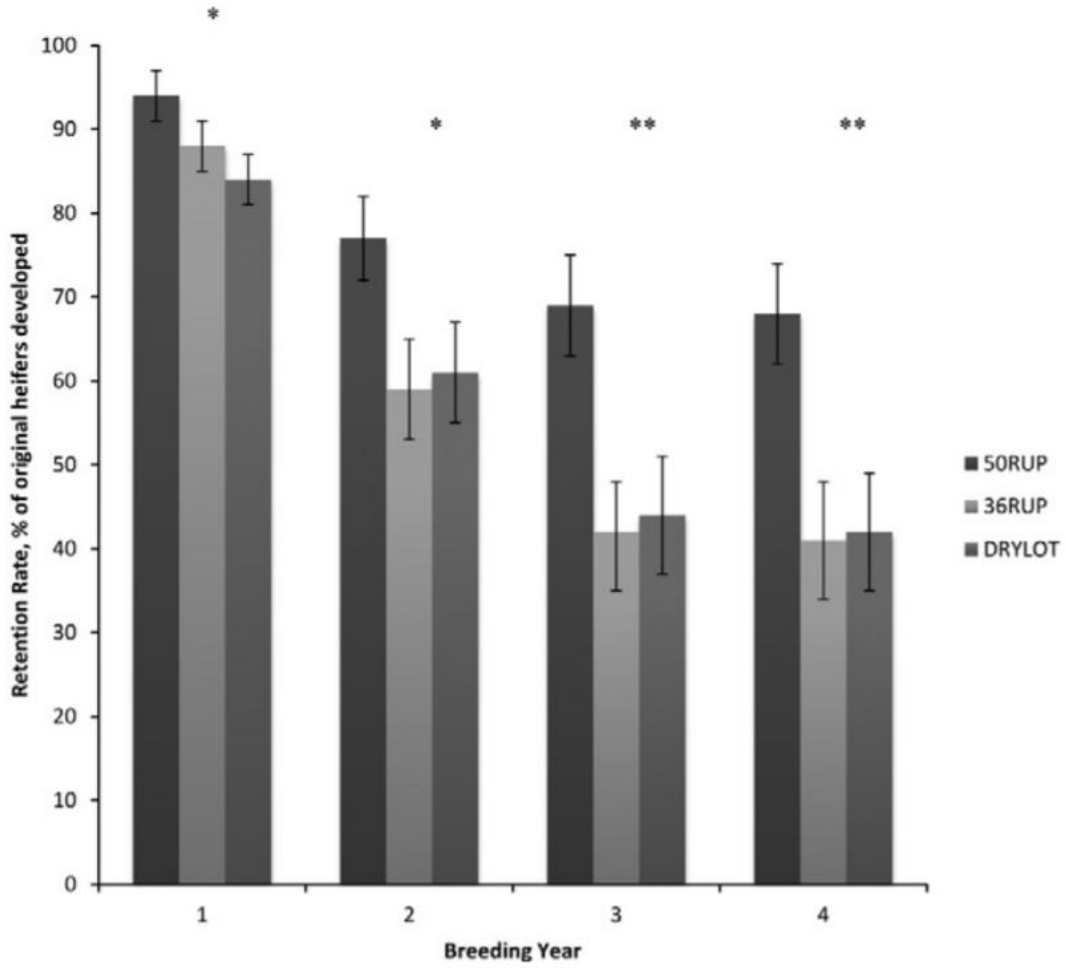


Perry et al. 2013. Prof. Anim. Sci. 29:595

Are there negative impacts on heifer development?

- **Heifers raised in drylots fall out of the herd faster than heifers raised on stalks.**

Why does this happen?



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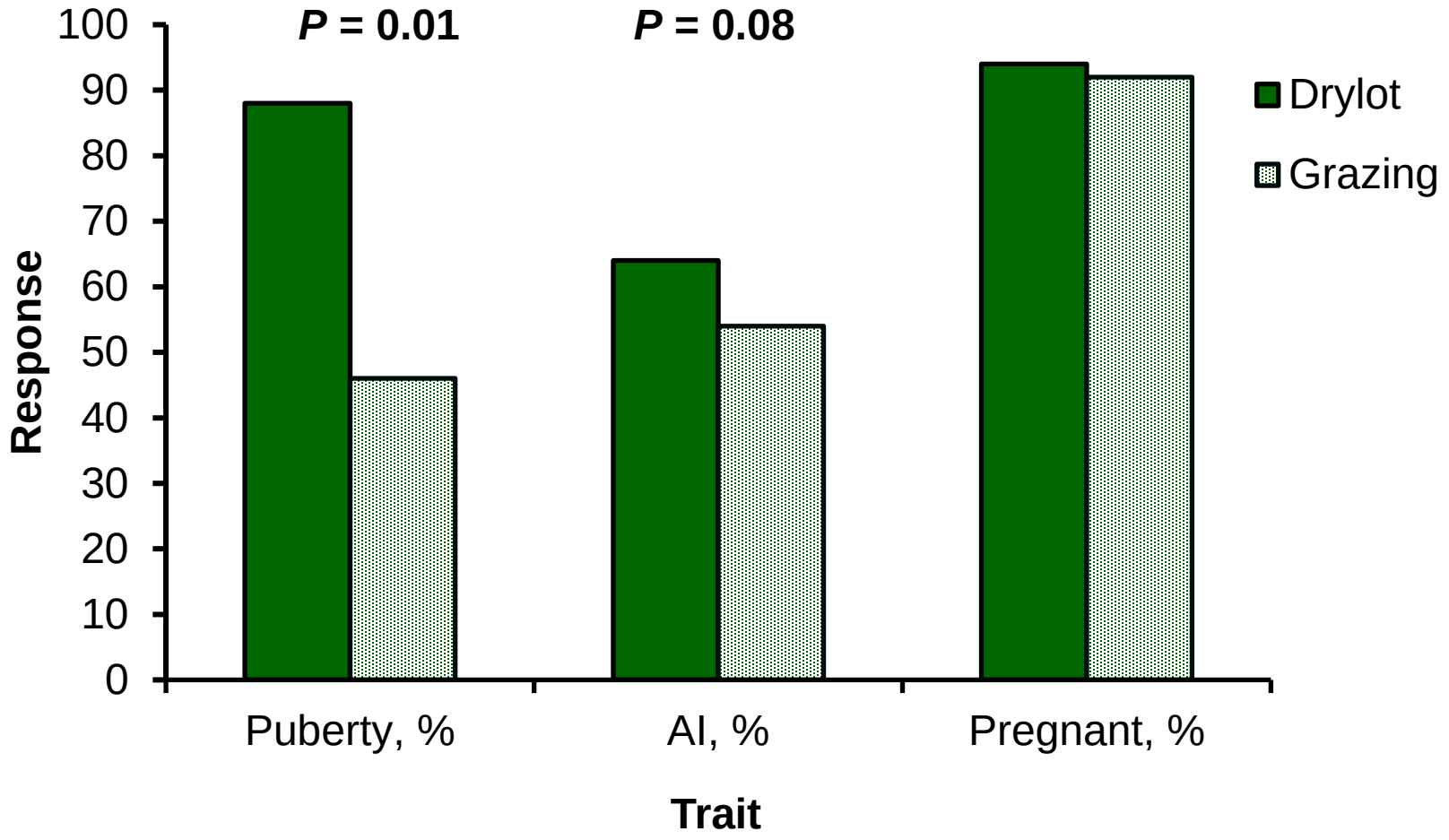
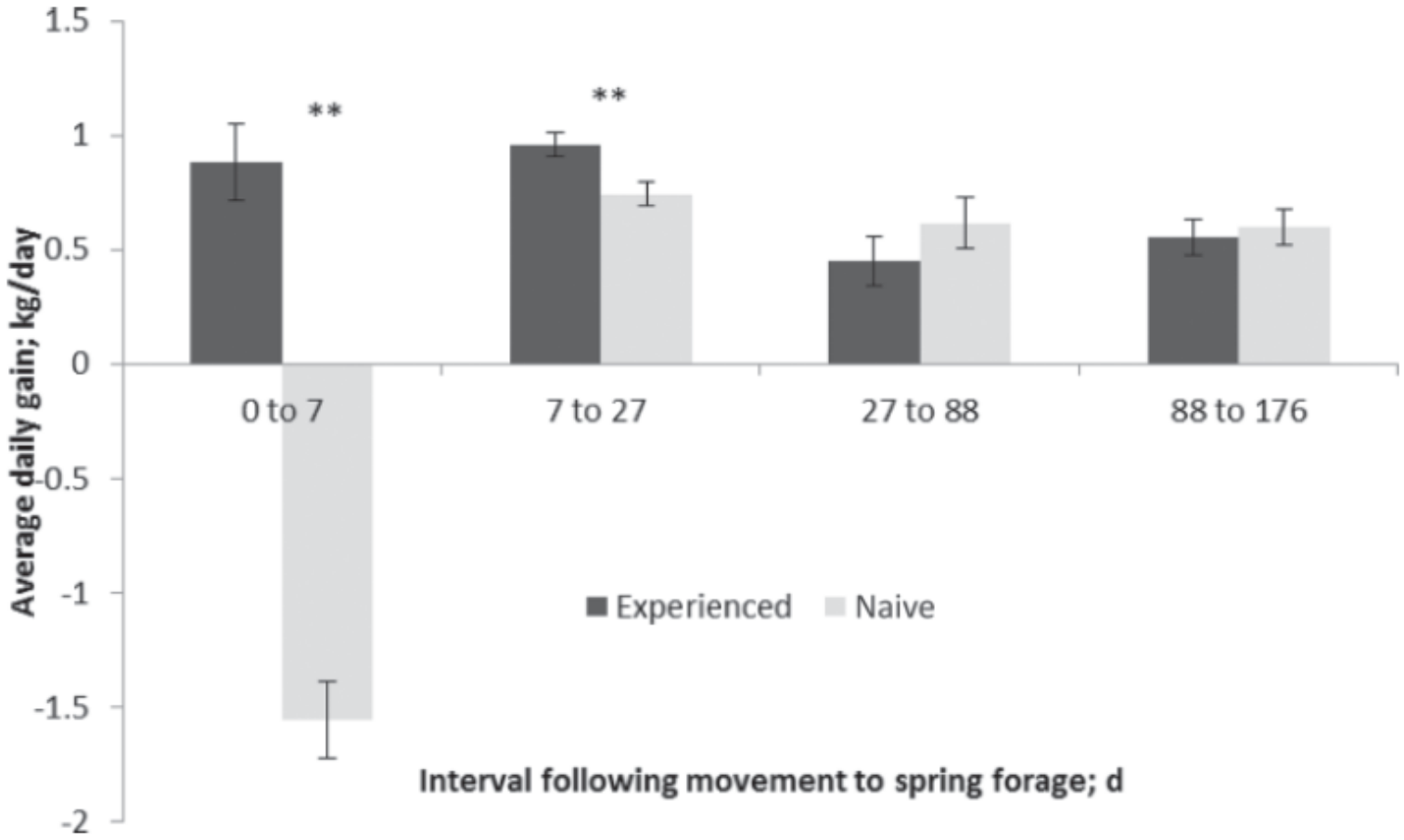
Minimal impacts on puberty and heifer pregnancy



Funston and Larson. 2011. J. Anim. Sci. 89:1595

Can we prepare drylot heifers to be ready for this?



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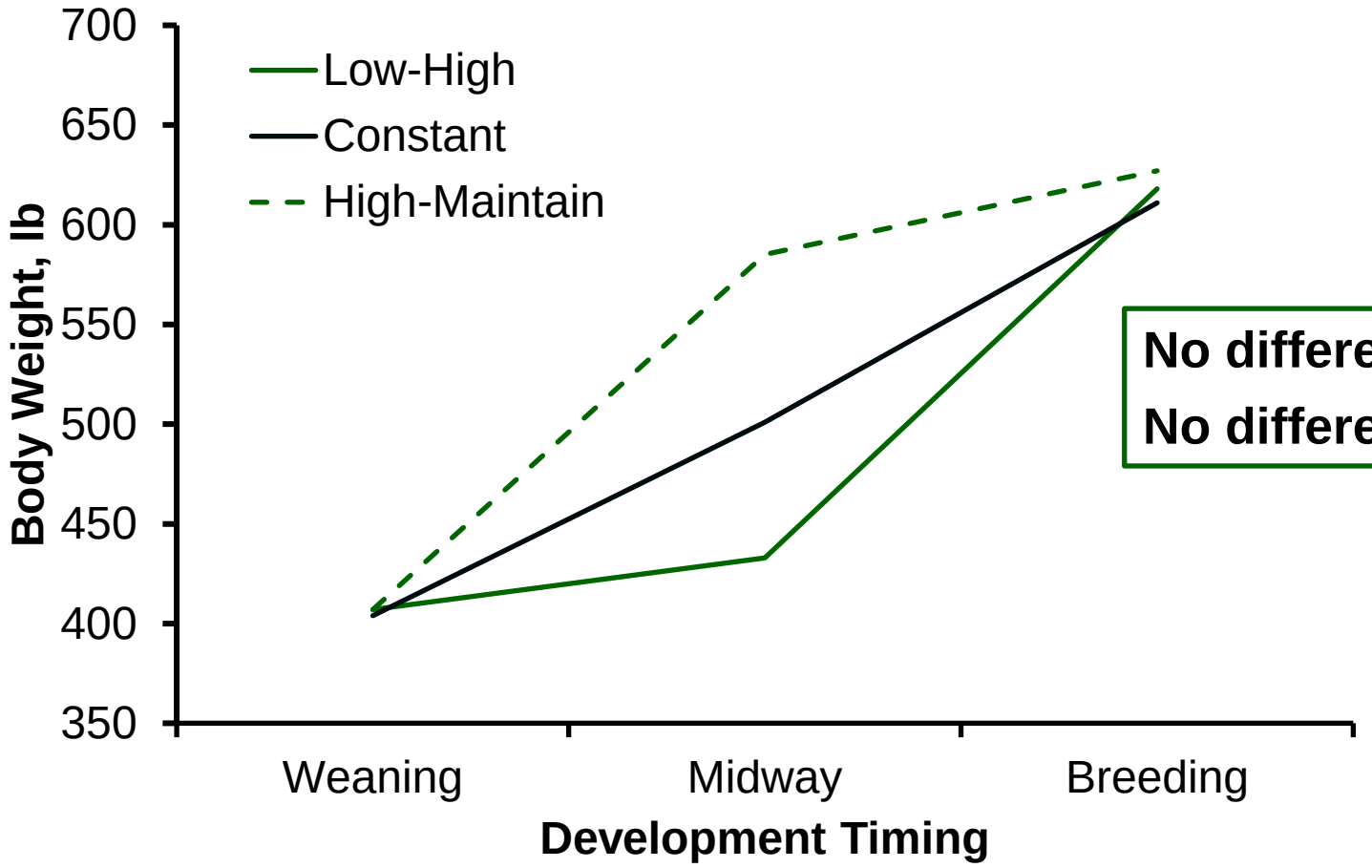
Time of gain has minimal impact on puberty and fertility



No difference in age at puberty.

No difference in pregnancy rate.

Clanton et al. 1983. J. Anim. Sci. 56:280

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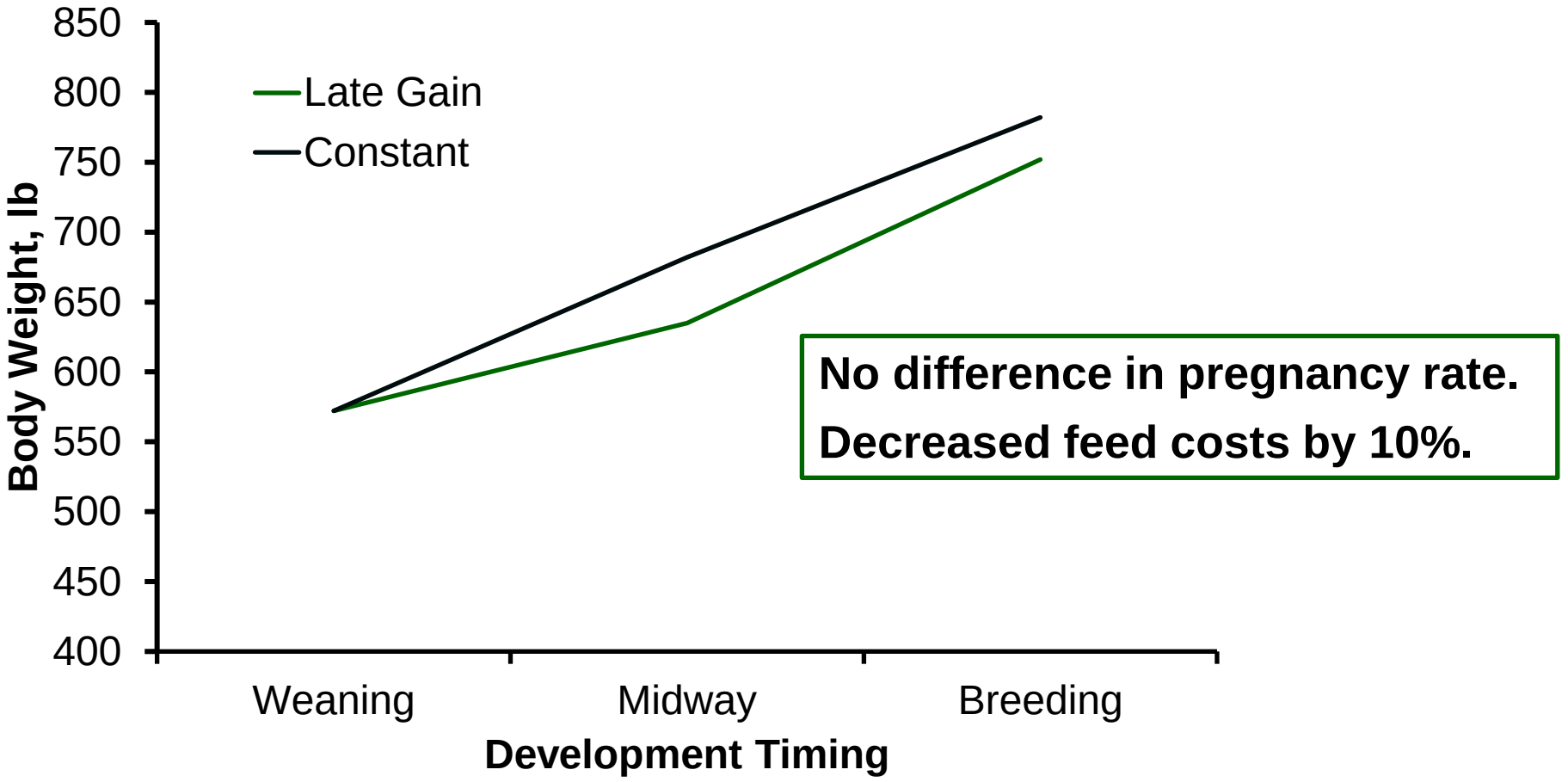
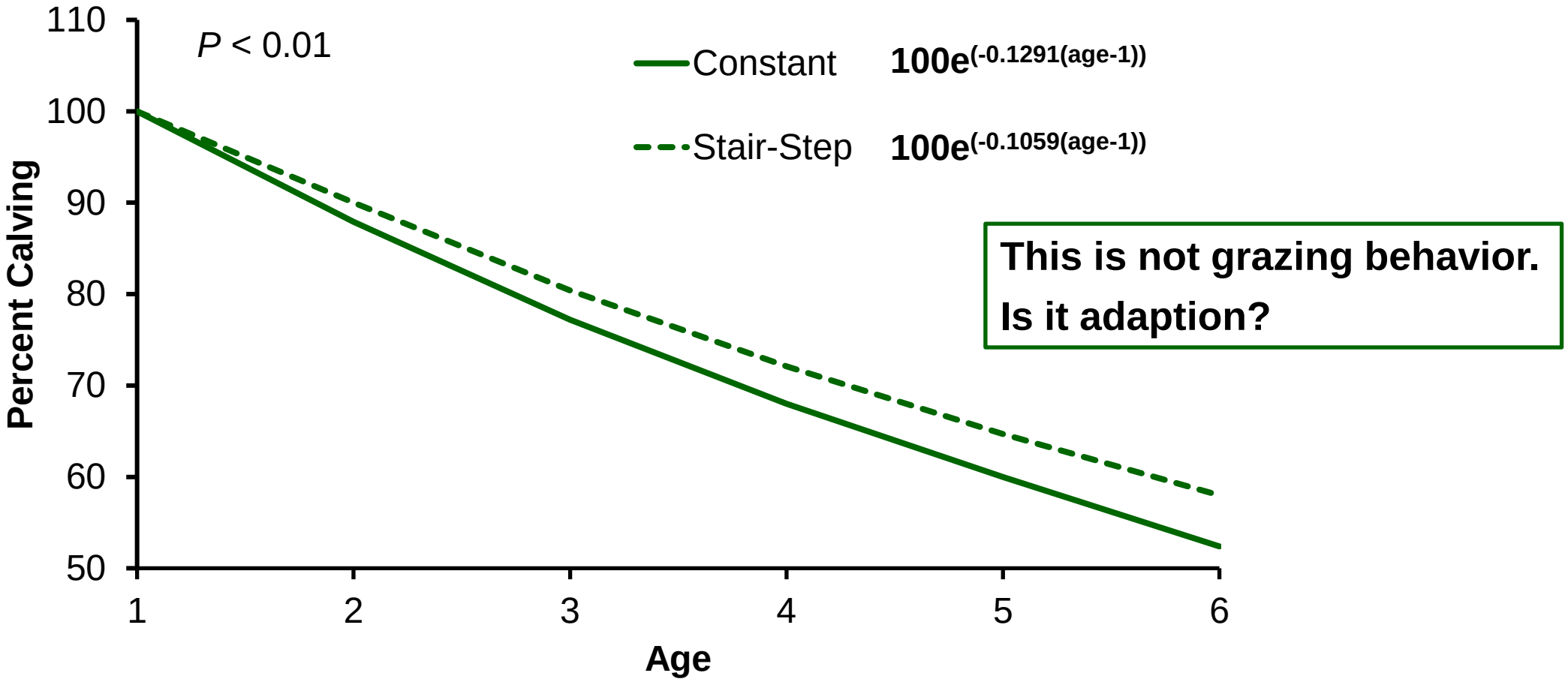


Lynch et al. 1997. J. Anim. Sci. 75:1715

Herd survival is greater in Stair-Step heifers



This is not grazing behavior.

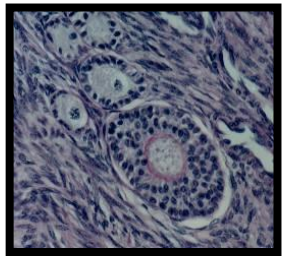
Is it adaption?

Freetly et al. 2020. Transl. Anim. Sci. (In revision)

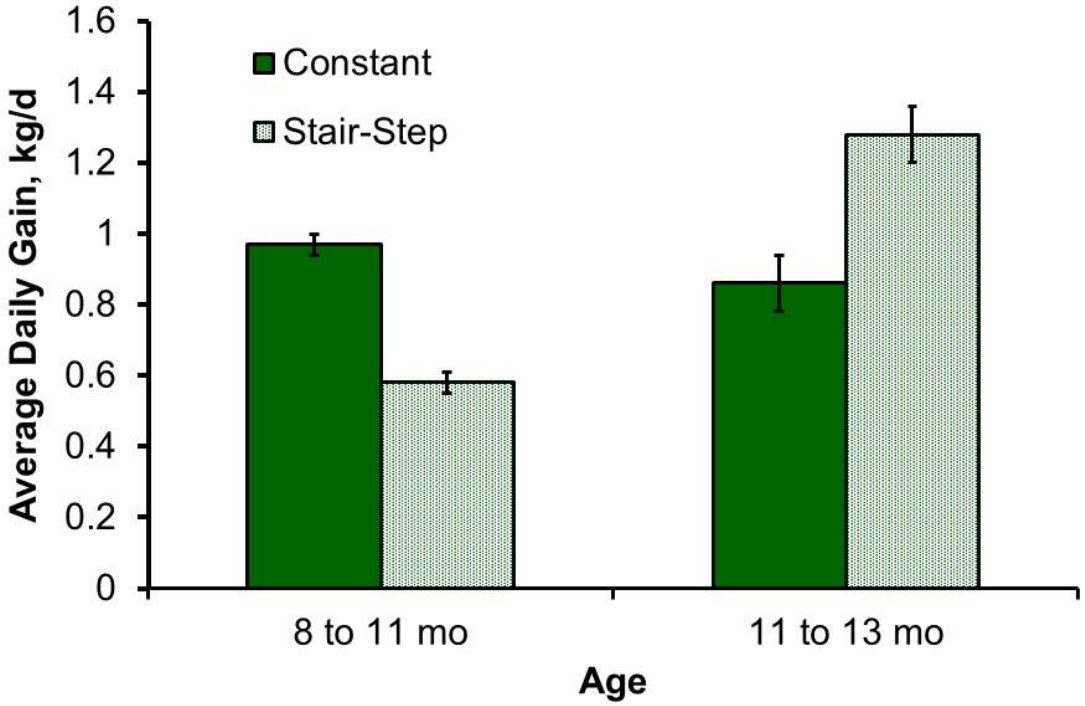
Developmental Programming

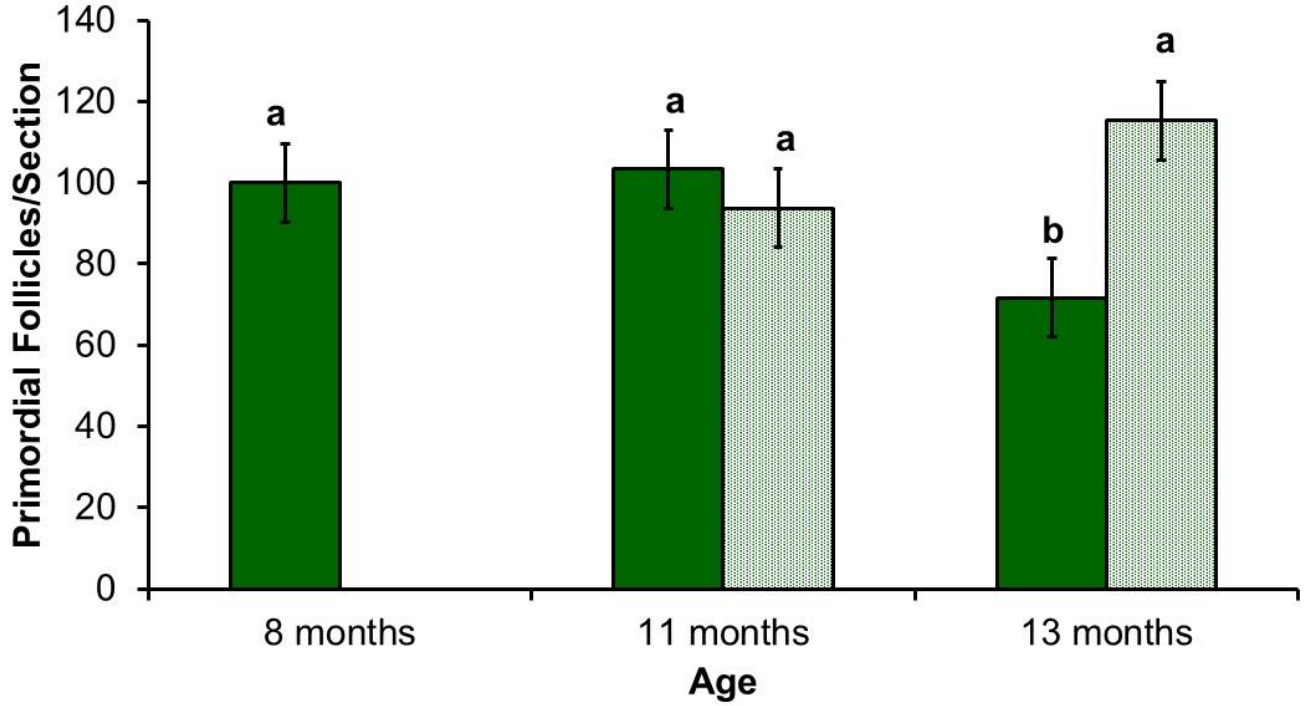
- **Not everything we do has just an immediate response**
- **What are the mechanisms**
  - **Adaption?**
  - **Physiology?**

Reducing intake in the peri-pubertal period spares the ovarian reserve



This looks like a greater rate of depletion in Constant gain



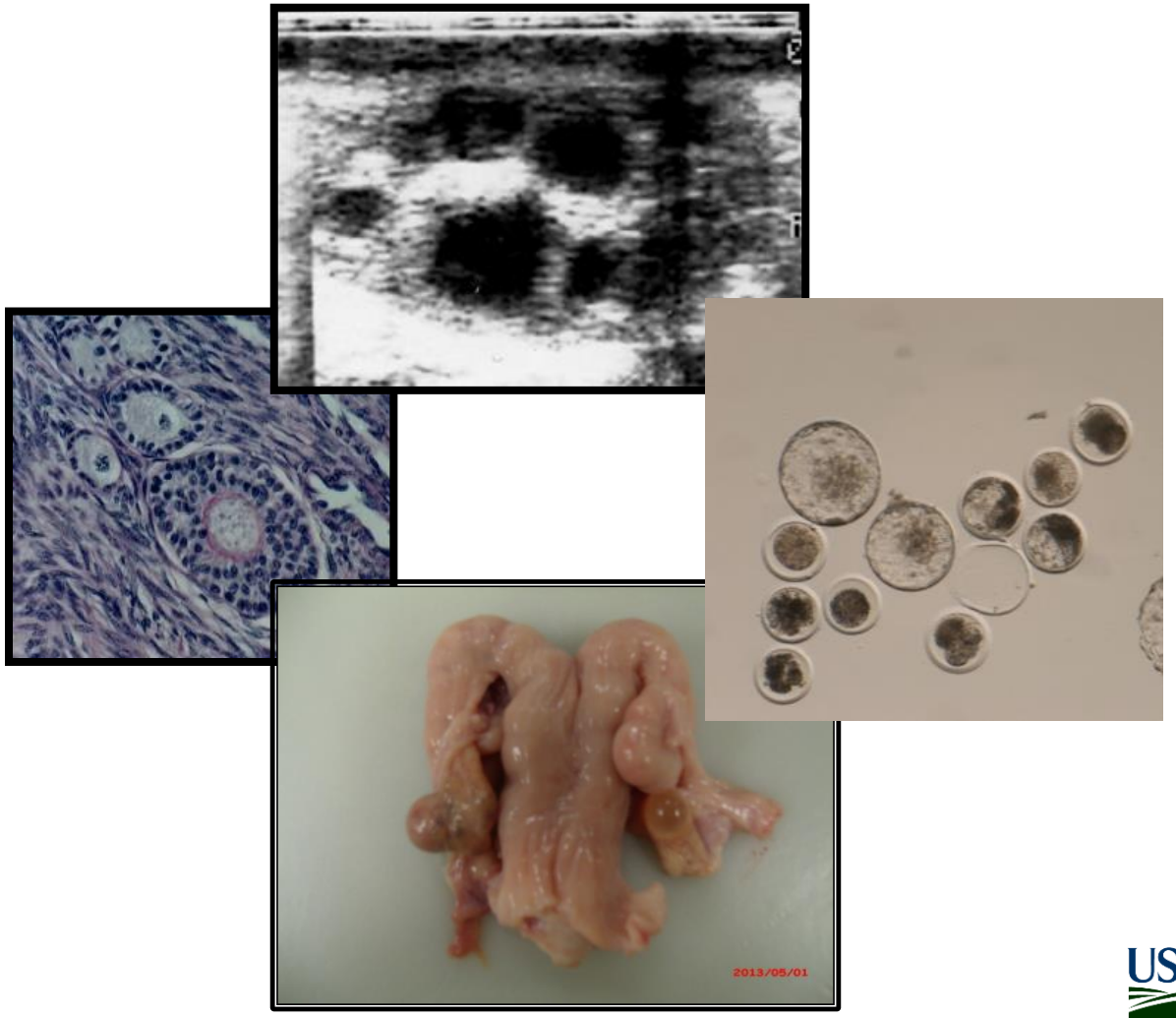


Rosasco et al. 2020. Trans. Anim. Sci. (Suppl. 1):S32
Abdel-Majad et al. 2020. Biol. Reprod. 102:680
Amundson et al. 2015. J. Anim. Sci. 93:5232
Freetly et al. 2014. J. Anim. Sci. 92:5437

USDA

Increased follicle numbers

- Conceive earlier
- Uterine environment more supportive of early embryonic development
- Improved response to exogenous gonadotropins



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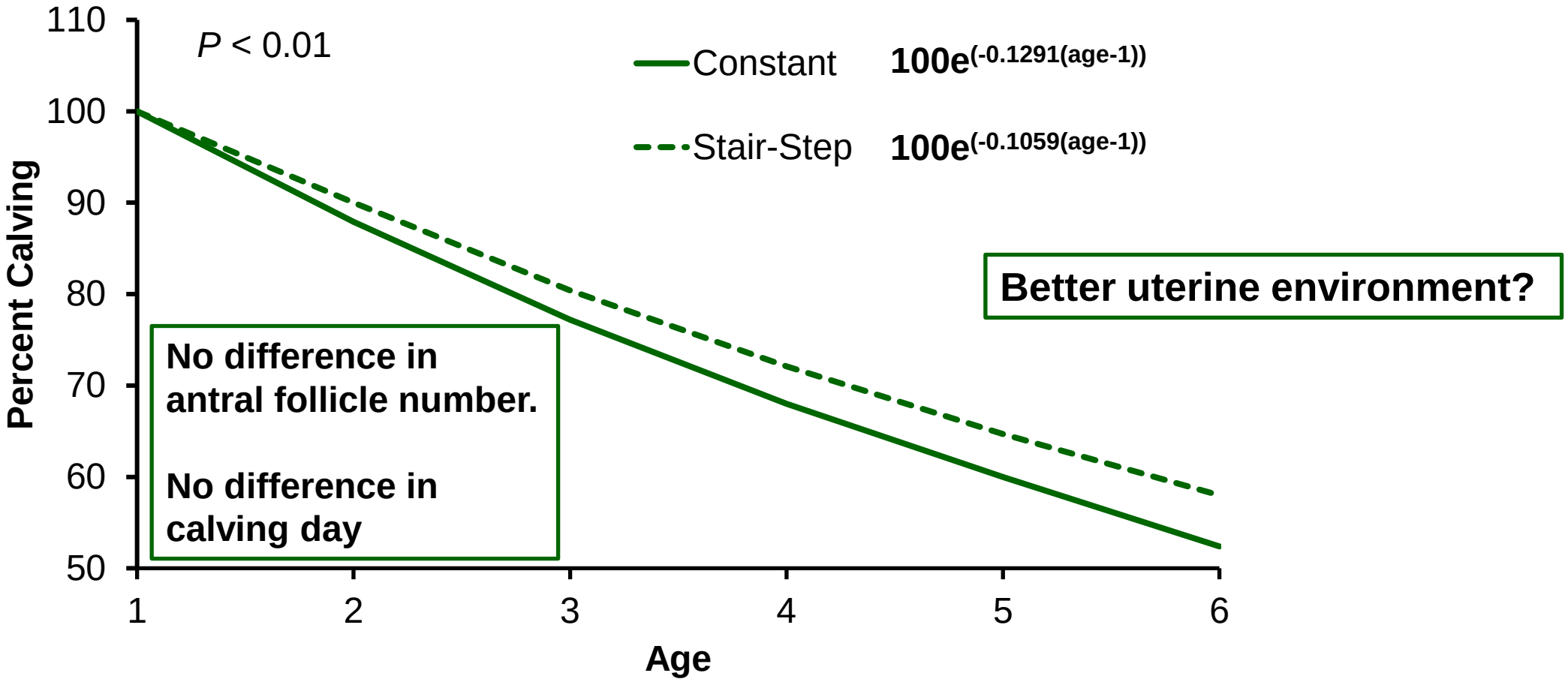
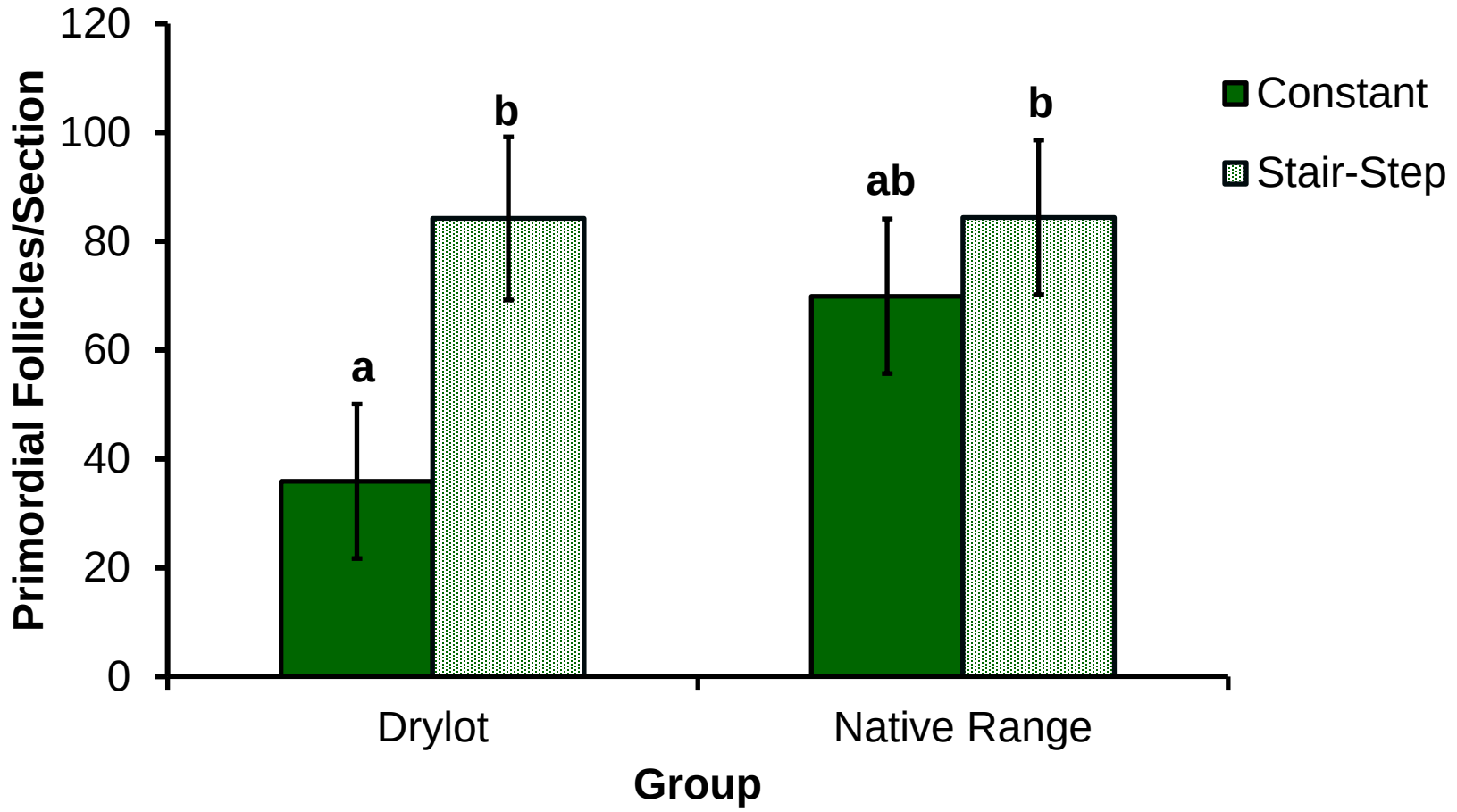


Freetly et al. 2020. Transl. Anim. Sci. (In revision)

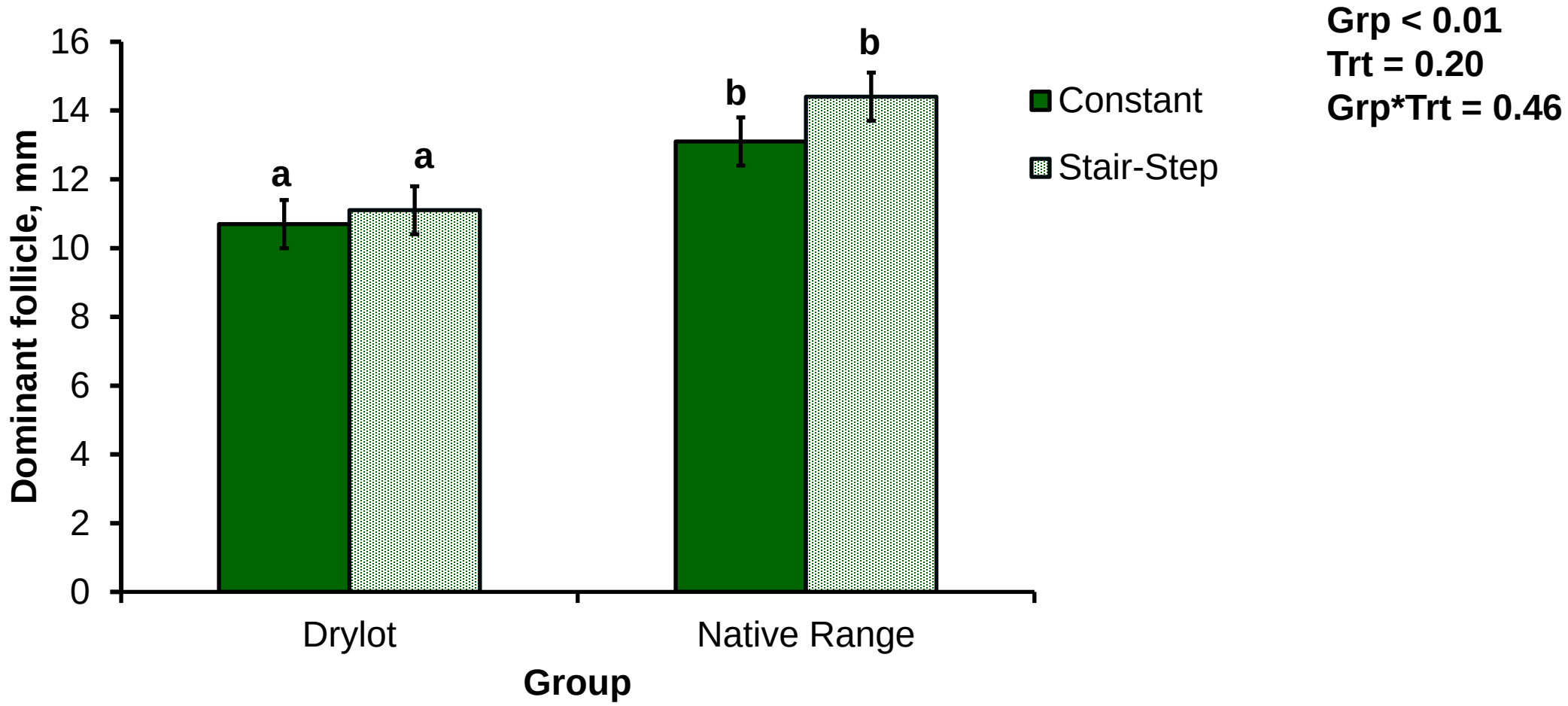
The effect is more dramatic when heifers are raised in a drylot



Grp = 0.24
Trt = 0.04
Grp*Trt = 0.25

Rosasco et al. 2020. Trans. Anim. Sci. (Suppl. 1):S32

Follicle is better in heifers developed on native range



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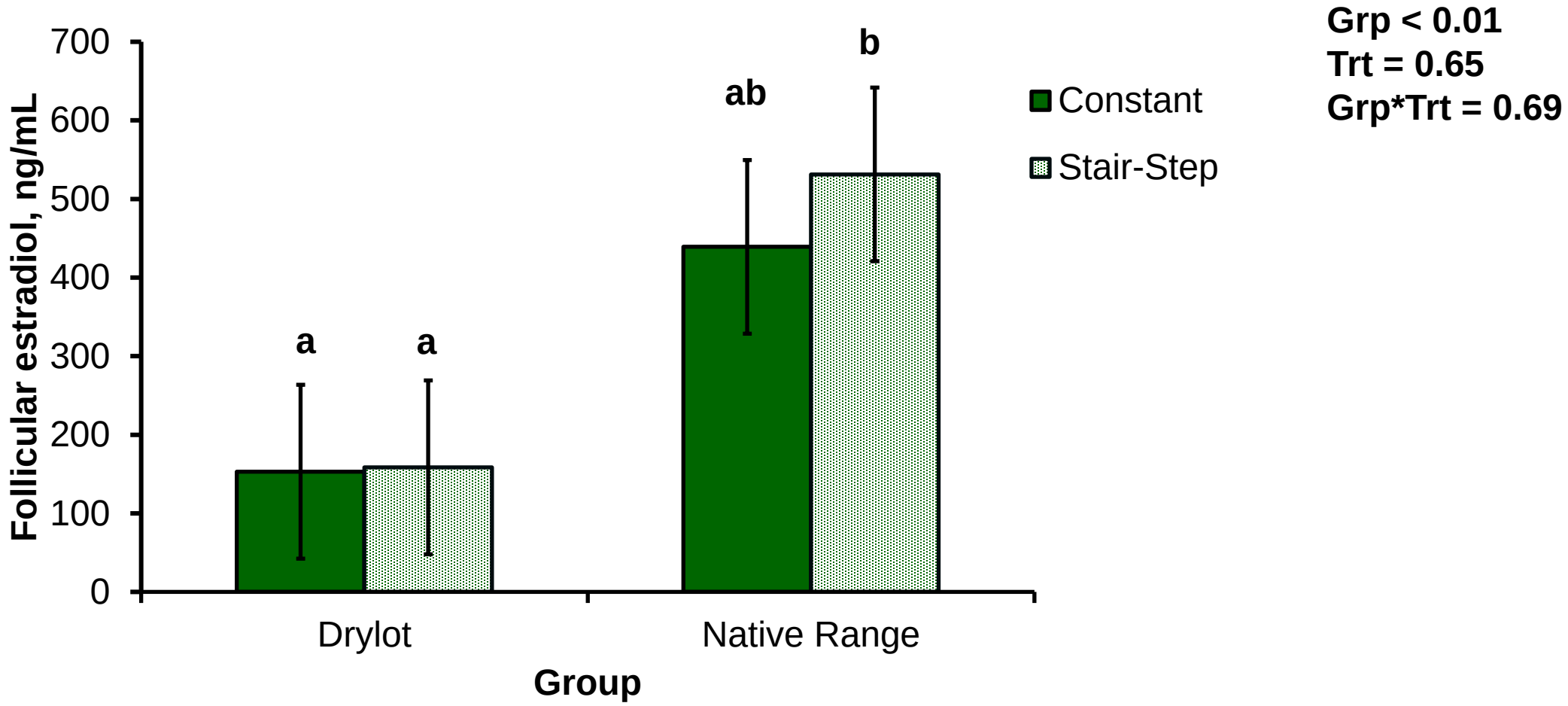

Rosasco et al. 2020. Trans. Anim. Sci. (Suppl. 1):S32

Implications

- **There is still a lot we do not know about developing replacement heifers in a drylot or on forage.**
  - **Why was ovarian development better on native range?**
  - **Are we missing something or feeding too much of something in the drylot?**
- **Dr. Spangler – buy bred 3-yr-olds**
  - **Not everyone belongs in the heifer development business.**
  - **Terminal crosses with no concern that selection for growth and carcass negatively impacts female performance.**

Questions

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