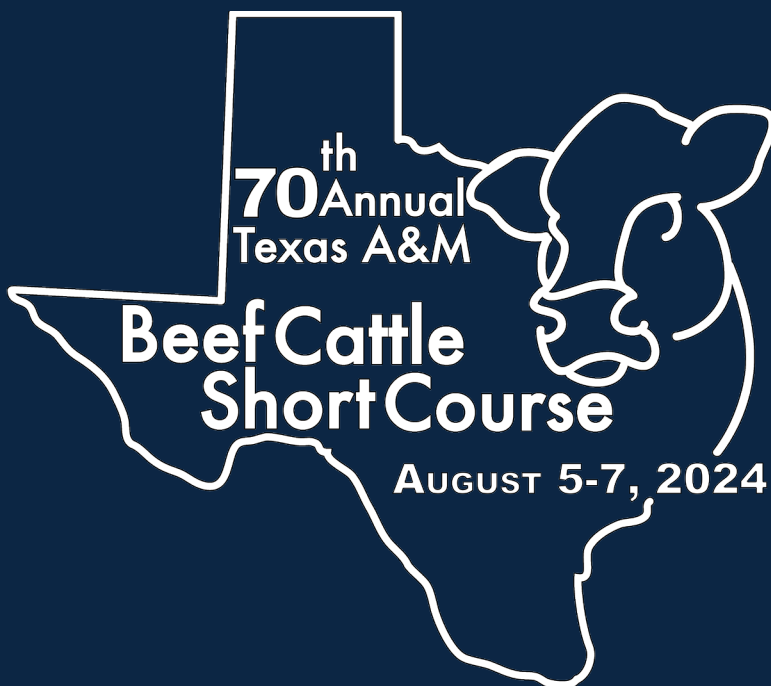


Farm to Fork: Finishing and Marketing Cattle on the Ranch

Coordinators: Dr. Rachel Cutrer
Dr. Rick Machen



TEXAS A&M
AGRILIFE
EXTENSION



Farm to Fork: Finishing and Marketing Cattle
on the Ranch





GO TEXAN.®

PARTNER BENEFITS GUIDE



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YOUR GO TEXAN PARTNER BENEFITS

**include promotional opportunities,
connections to funding, workshops,
networking, and access to some of
the largest events in Texas.**



GO TEXAN.[®]

**ADDITIONAL PARTNERSHIP
BENEFITS ARE
OUTLINED INSIDE.**



PROMOTIONAL OPPORTUNITIES

- ▶ Recognition on our GO TEXAN social media platforms (@gotexan), reaching over 97,000 fans.
- ▶ Sell your GO TEXAN products on our e-commerce site, the [GO TEXAN Market](#), for FREE.
- ▶ Participate in retail buyer meetings with grocers like H-E-B, Brookshire's, Aldi, Whole Foods, etc.
- ▶ Participate in international inbound trade missions. Contact GoGlobal@TexasAgriculture.gov
- ▶ Receive five professional images of your products FREE of charge through the [product photography](#) initiative, when you donate your products to GO TEXAN.
 - ◊ When you donate your products, GO TEXAN will use the products for giveaways and other promotional initiatives.
- ▶ Free or discounted advertising in publications such as *Cowboys and Indians* magazine.
- ▶ Participate in our Holiday Gift Guides that are sent to over 25,000 email subscribers.





USE THE GO TEXAN MARK

on your packaging, labels, products, website, etc.

Mark guidelines can be found on the [GO TEXAN website](#).

ACCESS TO FUNDING, WORKSHOPS, AND NETWORKING OPPORTUNITIES

- ▶ Participate in GO TEXAN's exclusive tradeshow, networking and workshop event, the [GO TEXAN Expo](#).
- ▶ Apply for various reimbursement grants, such as Event Grants, Farmers Market Assistance Grants and the GO TEXAN Marketing Enhancement Grant Assistance (MEGA) Grant, etc.
- ▶ Access to advisors at the University of Texas at San Antonio Small Business Development Center (UTSA SBDC) that can provide in-depth technical assistance on marketing and sales, access to needed capital, accounting and bookkeeping, human resource management and strategic planning for GO TEXAN businesses.
- ▶ Our GO TEXAN [monthly newsletter](#) is sent to all GO TEXAN Partners and provides information on exclusive opportunities to participate in upcoming events.
- ▶ Quarterly Partner Meetings where every Partner is invited to learn all about what GO TEXAN is doing to better serve you and your business.
- ▶ Network with other GO TEXAN Partners and the GO TEXAN team in our Exclusive [Partner Facebook group](#).
- ▶ Access to 10 regional outreach specialists who can help answer questions, share opportunities, and make connections.

HIGHER-TIER PARTNERSHIP

Interested in upgrading
your tier level?

Request to upgrade through
gotexan@TexasAgriculture.gov

- ▶ First access to all GO TEXAN-hosted events such as stock shows and rodeos, the GO TEXAN Pavilion at the State Fair of Texas, etc.
- ▶ Individual consultations with the GO TEXAN team to advise on how best to utilize your GO TEXAN partnership.
- ▶ Prominent listing in relevant digital publications.
- ▶ Company logo on the GO TEXAN Partner [search webpage](#).
- ▶ Prominent placement of your company logo on the [GO TEXAN website homepage](#).
- ▶ Customized [marketing benefits](#).



ACCESS TO SOME OF THE LARGEST EVENTS IN TEXAS

- ▶ Attending events with GO TEXAN has major benefits....and discounts!! Often, GO TEXAN Partners can participate in large events, tradeshows, festivals, etc. at a much lower cost by being in our designated area.
- ▶ The GO TEXAN Pavilion at the State Fair of Texas is GO TEXAN's largest outreach event for GO TEXAN Partners. We have a 25,000 sq. ft. building that contains opportunities such as:
 - ◊ The GO TEXAN General Store, a retail market where you can showcase and sell your products at the State Fair of Texas.
 - ◊ Sampling your products in the GO TEXAN General Store.
 - ◊ Sampling your wine, beer and spirits at the dedicated Pop-Up Porch.
 - ◊ Sampling and selling your products directly to fairgoers for the 24 days of fair at one of our Retail Porches.
 - ◊ If you can't participate all 24 days of Fair, the Pop-up Porch is available to GO TEXAN Partners selling their product in the General Store.
- ◊ Become an Exhibitor to showcase your organization's initiatives.
- ◊ Our GO TEXAN Communities booth is perfect for partner communities to spend a few days promoting their community and events to fairgoers.
- ◊ Want to make an even bigger impact? Consider our sponsorship opportunities in the GO TEXAN Pavilion that help you to further promote your business.
- ▶ Join us at Texas' biggest Stock Shows and Rodeos! GO TEXAN has a presence at the Fort Worth, Houston, Austin, East Texas, San Angelo, San Antonio, Rio Grande Valley, and Corpus Christi fairs, stock shows, and rodeos, and your company can participate with us by advertising or sampling/selling product.
- ▶ Display your products inside a GO TEXAN display case at events throughout the state.
- ▶ Customized signage for your business and products at all events that you participate in.

**INTERESTED IN LEARNING
MORE ABOUT ANY OF THESE
OPPORTUNITIES?**

**Reach out to GO TEXAN
at (877) 99-GOTEX or
gotexan@texasagriculture.gov**

GOTEXAN.ORG

FIND US ONLINE AT

 [instagram.com/GOTEXAN](https://www.instagram.com/GOTEXAN)

 [facebook.com/GOTEXAN](https://www.facebook.com/GOTEXAN)



**TEXAS DEPARTMENT OF AGRICULTURE
COMMISSIONER SID MILLER**



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AgriLifeExtension.tamu.edu

WHERE'S THE BEEF?

Legal and Economic Considerations for Direct Beef Sales

Justin Benavidez, PhD

Tiffany Dowell Lashmet, JD

Garrett Reed, JD
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Elizabeth Rumley, JD

Sarah Patterson, JD

Fundamentals of finishing cattle

Considerations for grain, grass, or combined grain and grass feeding programs

Dr. Jason Smith
Assistant Professor and Extension Beef Cattle Specialist
Department of Animal Science
Texas A&M AgriLife Extension – Amarillo



Overview

- Fundamentals of nutrition for finishing cattle
 - Meeting nutrient requirements
 - Minimizing cost of gain
- Specific opportunities to minimize overall finishing costs
 - Outline relevance using specific examples and analyses
 - Focus on common issues and misperceptions



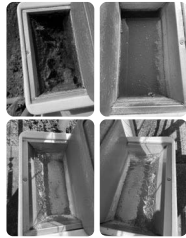
Why nutrition matters

- Genotype x environment = phenotype
- Nutrition is the major contributing factor to "environment"
- Interaction between nutrients/nutritional status and genes affect...
 - Growth and development
 - Gain and feed efficiency
 - Health
 - Beef composition and product quality



Water is the most important nutrient

- Water is critically important for growing and finishing cattle
 - Dehydration impacts the animal's resilience to stress and ability fight health challenges
 - Thirsty cattle typically will not eat
- Water should be...
 - Fresh
 - Cool
 - Clean

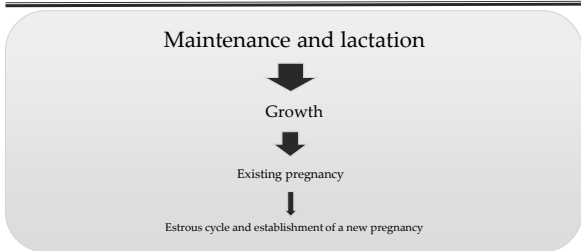


Nutrient requirements of growing cattle

| | Net energy for maintenance (NEm), Mcal/d | Net energy for gain (NEg), Mcal/d | Crude protein ¹ (CP), lbs/d |
|-----------------|---|--------------------------------------|---|
| 400-lb calf | -- | -- | -- |
| Gaining 1 lb/d | 3.7 | 1.0 | 1.2 |
| Gaining 2 lbs/d | 3.7 | 2.1 | 1.7 |
| Gaining 3 lbs/d | 3.7 | 3.3 | 2.2 |
| 600-lb calf | -- | -- | -- |
| Gaining 1 lb/d | 5.0 | 1.3 | 1.4 |
| Gaining 2 lbs/d | 5.0 | 2.9 | 1.9 |
| Gaining 3 lbs/d | 5.0 | 4.5 | 2.4 |
| 800-lb calf | -- | -- | -- |
| Gaining 1 lb/d | 6.2 | 1.6 | 1.7 |
| Gaining 2 lbs/d | 6.2 | 3.5 | 2.1 |
| Gaining 3 lbs/d | 6.2 | 5.4 | 2.6 |

¹Assumes the calf is consuming enough energy to allow a conversion efficiency from crude to metabolizable protein of 60 %
Adapted from the NASEM (NRC), 2016.

Nutrient partitioning (prioritization)



Nutrient requirements of growing cattle

| | Net energy for maintenance (NE _m), Mcal/d | Net energy for gain (NE _g), Mcal/d | Crude protein ¹ (CP), lbs/d |
|-----------------|--|---|---|
| 400-lb calf | -- | -- | -- |
| Gaining 1 lb/d | 3.7 | 1.0 | 1.2 |
| Gaining 2 lbs/d | 3.7 | 2.1 | 1.7 |
| Gaining 3 lbs/d | 3.7 | 3.3 | 2.2 |
| 600-lb calf | -- | -- | -- |
| Gaining 1 lb/d | 5.0 | 1.3 | 1.4 |
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¹Assumes the calf is consuming enough energy to allow a conversion efficiency from crude to metabolizable protein of 60 %
Adapted from the NASEM (NRC), 2016.

Nutrient hierarchy

- Energy drives growth and performance
- Other nutrients support an energy-dependent level of growth and performance
 - Protein (to provide amino acids)
 - Minerals
 - Vitamins

Let's work through a scenario

- Let's make the assumption that we're finishing cattle on grass
 - 1 steer calf
 - Frame score of 4.5
 - Starting weight of 700 lbs
 - Target finished weight of 1150 lbs
 - Calf needs to gain a total of 450 lbs
 - Feeding hay as the sole source of energy and protein

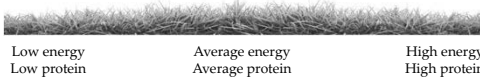
Our scenario...

- We're going to use data from the TN Soil, Plant, and Pest Center
 - 2,039 forage analyses reported between 8/27/15 and 6/19/17

| Nutrient, unit | Low | High | Average |
|---------------------------------|------|------|---------|
| NE _M , Mcal/lb of DM | 0.19 | 0.93 | 0.65 |
| NE _G , Mcal/lb of DM | 0.02 | 0.65 | 0.39 |
| TDN, % of DM | 35.3 | 84.9 | 64.3 |
| CP, % of DM | 2.7 | 28.5 | 10.9 |

Our scenario...

- We're going to use data from the TN Soil, Plant, and Pest Center
 - 2,039 forage analyses reported between 8/27/15 and 6/19/17



Low energy
Low protein

Average energy
Average protein

High energy
High protein

Our scenario...

- We're going to use data from the TN Soil, Plant, and Pest Center
 - 2,039 forage analyses reported between 8/27/15 and 6/19/17



Low
average

Median
average

High
average

Forage A
\$175/ton

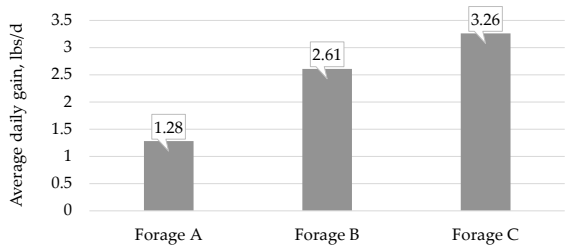
Forage B
\$250/ton

Forage C
\$325/ton

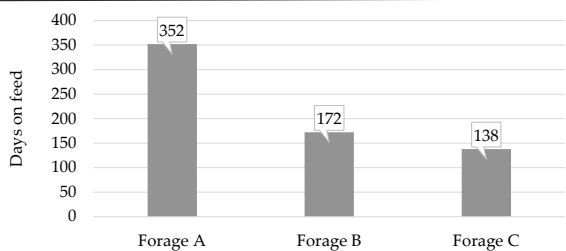
Our scenario...

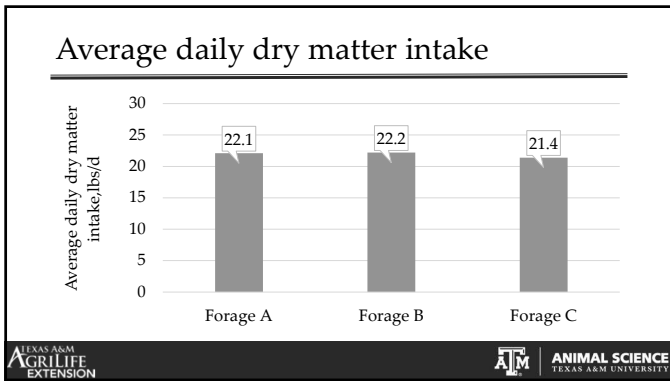
| Nutrient | Forage A | Forage B | Forage C |
|---------------------------------|----------|----------|----------|
| NE _M , Mcal/lb of DM | 0.51 | 0.67 | 0.77 |
| NE _G , Mcal/lb of DM | 0.26 | 0.41 | 0.50 |
| TDN, % of DM | 54.6 | 65.6 | 72.7 |
| CP, % of DM | 8.5 | 10.6 | 13.6 |

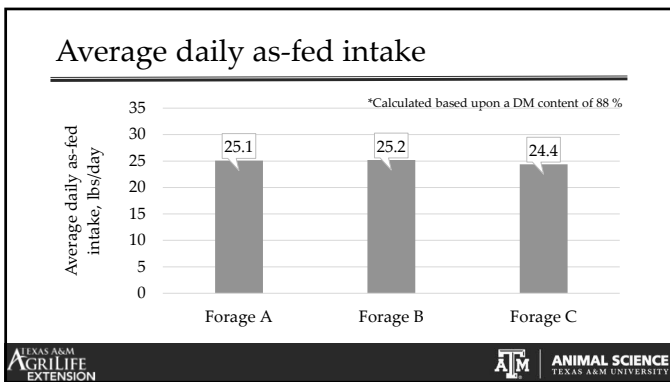
Average daily gain

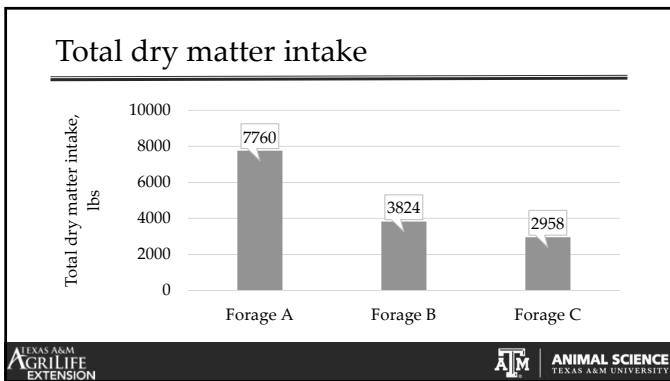


Days on feed

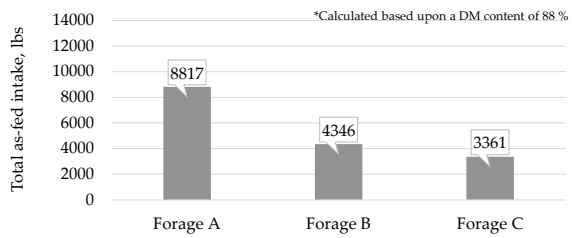




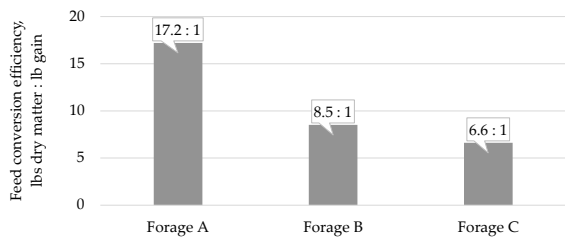




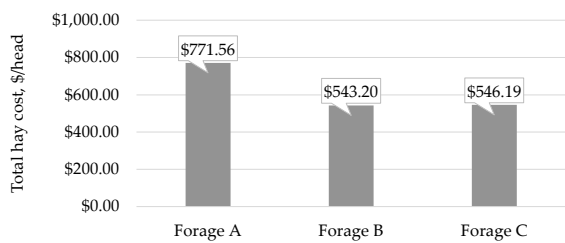
Total as-fed intake



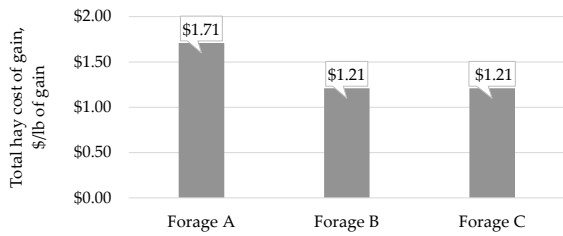
Feed conversion efficiency



Total hay cost



Hay cost of gain



Sorting through supplement options

- Five major factors to consider:
 - 1) What options are available to you?
 - 2) Do they supply what your cattle need?
 - 3) Do they require additional expense or lead to savings in terms of time, labor, storage, or waste?
 - 4) Do any of those options act as a vehicle for something else that adds value?
 - 5) Which option is the most economical means of filling the nutrient void?

Focus on nutrient cost

- Not all feeds were created equally
- Retail price doesn't always reflect those differences
 - Differences in nutrient content bias the comparison
- Base supplementation decisions on nutrient needs and supplement value
 - Levels the playing field by accounting for differences in nutrient content
 - Allows for an un-biased comparison

$$\text{Nutrient cost} = \frac{\text{final cost per lb of feed}}{\text{amount of nutrient per lb of feed}}$$

Supplemental feedstuff cost and value calculator



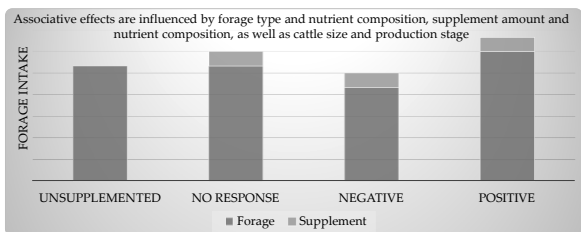
Available at <https://beef.tamu.edu>, publications, current news

Hidden costs of supplementation

- Don't forget the hidden costs of supplementation
 - Supplementation costs much more than the feedstuff's purchase price
- Hidden costs that are often "forgotten"
 - Transportation/delivery
 - Storage facilities
 - Feeding equipment
 - Labor/time
 - Shrink

Additional decision-making tool in progress, will eventually be available at <https://beef.tamu.edu>

Associative effects of supplemental feedstuffs



Adapted from the Oklahoma Beef Manual (Lalman and McCollum 1997)

Associative effects of supplemental feedstuffs

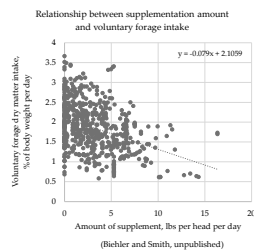
- Associative effects can be strategically used to...
 - Increase forage utilization
 - Decrease forage intake

*It's generally one or the other
NOT BOTH*



General effect of supplementation on forage intake

- Supplementation typically influences forage intake
 - We have a “decent” understanding of how different ingredients influence voluntary forage intake
 - Associative effects on voluntary forage intake become far more difficult to predict for blended feeds



Supplementation and forage utilization

- Supplementation is often expected to influence forage utilization
 - “Utilization” = digestibility
 - As rate or extent of digestibility increases
 - Cattle access more energy from the forage
 - Forage intake increases
- Protein supplementation will generally increase utilization of low and medium quality forages
 - This will make forages disappear faster
 - Only expected when forages are “deficient” in protein (TDN:CP > 7)



Forage displacement (substitution)

- Some supplements displace more than their own weight in forage
 - High starch and/or high fat feedstuffs
 - Approximately 1.5 units of forage displaced by 1 unit of supplement
 - Corn, wheat, whole cottonseed
- Some supplements displace a similar amount of their own weight in forage
 - Moderate protein, high fiber feedstuffs
 - Approximately 1 unit of forage displaced by 1 unit of supplement
 - Soybean hulls, wheat middlings, corn gluten feed
- Some supplements displace less than their own weight in forage
 - High protein feedstuffs
 - Approximately 0.5 units of forage displaced by 1 unit of supplement
 - Distiller's grains, cottonseed meal, soybean meal

(Based upon data from Biehler and Smith, unpublished)

Currently working to develop prediction models and decision-making tools that optimize supplementation strategies

Mineral and vitamin nutrition

- The value of mineral and vitamin nutrition should not be overlooked
 - Responses generally range from a 10 to 30 % improvement in ADG, less morbidity, and greater response to treatment
 - Expect magnitude of response to be directly related to the magnitude of deficiency
 - Unless they are eating a TMR or supplement at a level that will meet their mineral and vitamin requirements, they need to be supplemented



Mineral supplementation

- Mineral supplementation is crucial
 - Forages + trace mineralized salt will almost never meet mineral requirements
 - Buffet-style mineral supplementation is not an effective means of meeting mineral requirements

Options for finishing programs

- 1) Complete supplement, fed free choice
- 2) Complete supplement, hand fed
- 3) Included as a component of a supplement, blended feed, or total mixed ration

Don't mess up the system

- We feed the microorganisms, and the microorganisms feed the cattle
- Rumen microorganisms are creatures of habit
 - The rumen environment is sensitive to changes
- We use various aspects of feeding management to promote the degree of consistency that is desired by the rumen system
 - Minimize changes
 - Any changes that are made occur gradually, through a transition
 - Feed a certain amount of roughage in the diet to promote rumination

Transition rations

- More rations = more (potential for) problems
- Not all operations need more than one base ration
 - Especially if cattle will primarily graze pasture
- Proponent of a modified two-ration blending system
 - Ration 1 = hay, free choice
 - Ration 2 = base ration, increased amount offered over time

Transitioning cattle to a TMR

- Transitions should occur gradually
 - Start calves at $\leq 0.5\%$ of body weight BW in DM, or at previous intake
 - Increase by no more than 10% at a time
 - No more often than once every other day, up to 2% of body weight in DM
 - 3 to 5% once every third day after that
 - Beware of sorting



Common issues

- Problematic formulations
- Too many rations
- Overfeeding, overprocessing
- Inconsistent blending
- Abrupt ingredient changes
- Poor ingredient management
- Feeding too much water, too much fat, too much (or too little) drug or additive

Available growth-promoting technologies

- Ionophores
- Growth-promoting hormone implants
- Beta-adrenergic receptor agonists ("beta-agonists")

Available growth-promoting technologies

| Item | Implant | Ionophore | Beta-agonist | Implant + ionophore | Implant + ionophore + beta-agonist |
|-------------------------|---------|-----------|--------------|---------------------|------------------------------------|
| Final weight, lbs | +100 | -- | +18 | +100 | +118 |
| Average daily gain, lbs | +0.5 | +0.1 | +0.1 | +0.6 | +0.7 |
| Dry matter intake, lbs | +0.86 | -0.53 | +0.11 | +0.33 | +0.44 |
| Feed:gain | -0.85 | -0.17 | -1.02 | -0.17 | +1.19 |
| Dressing percent, % | +0.32 | -- | +0.32 | +0.34 | +0.66 |
| Hot carcass weight, lbs | +68 | -- | +68 | +15 | +83 |

Values adapted from Crawford et al. (2021)

Ionophores

- Antimicrobial drugs used to medicate feed
 - Alter the rumen microbial population in a way that promotes feed efficiency
 - Improve feed efficiency
 - Added weight gain
 - Decreased cost of gain
 - Mitigate a portion of health risks from coccidia and bloat

Ionophores

- Available drug (product) options include monensin (Rumensin or Monovet) and lasalocid (Bovatec)
 - Expected to increase average daily gain by...
 - 3 to 5% in grain-based finishing programs
 - 10 to 12% in forage-based finishing and stocker programs
 - 6 to 8% in suckling calves
 - Expected to cost...
 - \$0.04 to \$0.08 per head per day for grain-based finishing programs
 - \$0.03 to \$0.06 per head per day for forage-based finishing and stocker programs
 - \$0.01 to \$0.02 per head per day for suckling calves

Growth-promoting hormone implants

- Small pellet(s) inserted into the backside of the ear
 - Deliver a steady stream of steroid compounds that mimic natural hormones
 - Have a direct effect on the animal's ability to produce and utilize the nutrients in the feed
 - Increase feed intake
 - Decrease feed wastage

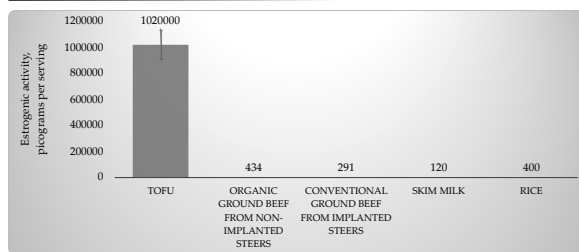


Estrogen content of common foods

| Food | Combined estrogen content Ng of estradiol and estrone per 3 oz. |
|-------------------------------|--|
| Defatted soy flour | 128,423,201 |
| Tofu | 19,306,004 |
| Pinto beans | 153,087 |
| White bread | 51,029 |
| Peanuts | 17,010 |
| Eggs | 94 |
| Milk | 5.4 |
| Beef from implanted steer | 1.2 |
| Beef from non-implanted steer | 0.9 |

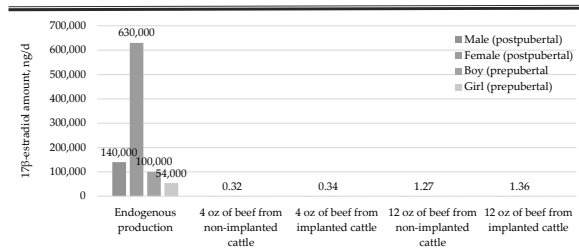
Adapted from Loy (2011) and Blair (2021)

Estrogenic activity of various foods



Adapted from Shappell et al., 2019

Hormone content of beef vs. normal daily human production



Data extrapolated from Hartmann et al. (1998) and Fritsche et al. (1999)

Growth-promoting hormone implants

- Add lbs that were otherwise unobtainable

| Phase | Expected increase in average daily gain | Administered cost, \$ per head |
|-----------|---|--------------------------------|
| Suckling | 5 to 6% | \$3.00 to \$4.00 |
| Growing | 8 to 12% | \$3.00 to \$6.00 |
| Finishing | 10 to 25% | \$3.00 to \$8.00 |

- Little (but some) effect on quality grade

- Extend growth curve, increase time required to reach X degree of finish

Beta-agonists

- Increase live animal and carcass weight through lean muscle accretion during the end of the finishing phase
 - Decrease muscle breakdown
 - Increase muscle synthesis
- Only approved for use in "cattle fed in confinement for slaughter"
 - Ractopamine HCl (Optaflexx, Actogain, Optigrid, RAC)
 - Lubabegron (Experior)
- Ractopamine will be most feasible when fed through a top-dressed supplement for small-scale operations

Spaying heifers

- Seems to be a desire to spay heifers as an alternative to feeding melengesterol acetate (MGA) for estrus suppression
- Majority of the data does not support spaying heifers
- Removal of the ovaries negatively impacts intake, growth, and feed efficiency
 - Loss from spaying > loss from riding
 - Requires an implant to bring them back to non-spayed level of performance

Take-home points

- Focus on meeting nutrient requirements in the most economical way possible
- Energy is the primary driver of growth of performance
- Consider utilizing growth-promoting technologies to add value to cattle and minimize cost of gain