Trends in the Production and Marketing of Grass-fed Beef

(History, Science, Production, & Marketing)

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Introduction

"The problem with pioneering a new industry is that the ancillary support businesses necessary to easily get the product from pasture to the consumer doesn't exist" –Allen Nation

- History
- Science
- Production
- Marketing

Overview

- Ruminants have evolved to efficiently utilize fibrous forages in their diets.
- Modern agriculture has substituted grains for forages in finishing diets to increase efficiency, uniformity, and acceptability of beef products.
- Periods of high grain prices threaten the profitability of finishing beef cattle on grain diets.
- Research has revealed health benefits from the consumption of grass-finished beef products including lower total fat and higher concentrations of health promoting fatty acids and antioxidants.
- Consumers are increasingly demanding grass-finished beef and paying a premium for these products due to perceived health benefits and environmental sustainability.

History

- Aided by cheap grain, large expanses of rangeland, and centralized meat-packers grain-feeding has a long history in the U.S.
- By 1916 the beef industry was divided into grass-fed (summer) and grain-fed (winter).
- Research studies first appear on forage-finishing during the 1930s and 1940s.
- Government subsidized grain production has led to the dominance of the feedlot industry in the United States.
- Interest is renewed in finishing beef on forages during periods of high grain prices. As Oltjen et al. predicted in 1971, "In the future, it is quite possible that the cereal grains will become too expensive to feed to ruminants in large quantities because of the direct competition with the rapidly expanding human population."
- Studies conducted in the 1970s comparing forage- to grain-finished beef revealed a trend of decreased overall acceptability of forage-finished beef compared to grain-finished beef.
- During the last decade, forage-finished beef research has focused on the positive attribute of finishing cattle on forages in response to growing negative perceptions of red meat.

Science

Negative Perceptions:

- Finishing cattle of forages reduces animal performance.
- Finishing cattle on forages produces smaller carcasses with less fat and muscling, lower yield grades, and lower dressing percentages potentially due to greater ruminal fill, but quality grade is not necessarily affected.
- There are long held perceptions that forage-finished beef tends to have off-flavors (grassy, milky, fishy, sour), yellow fat, low tenderness, course texture, low juiciness, low consumer acceptability.

Dispelling Negative Perceptions:

- Research is not consistent due to differing slaughter endpoints (degree of finish –vs- age) and feeding regimes (forage quality).
- Off-flavors may be due to a higher content of unsaturated fats, which are less stable and can lead to oxidative rancidity. However, higher concentrations of antioxidants (Vitamin E) can protect against oxidation. Legumes may cause less off-flavors and increase tenderness.
- Slaughtering younger animals with an acceptable degree of finish, and aging grass-fed beef for 14 days increases tenderness.

Fat Science

- Ruminants have an unfavorably low polyunsaturated fat (PUFA) to saturated fat (SFA) (P:S) ratio (beef – 0.11, and lamb - 0.15) compared to pork (0.45). The Department of Health recommends a P:S ratio of 0.45 or higher. The low P:S ratio in ruminants is a result of biohydrogenation of dietary unsaturated fats in the rumen.
- Saturated fats (except Stearic acid which is neutral) are linked to increased "bad" cholesterol (LDL) which increases the risk for coronary heart disease in humans, plus raising total blood cholesterol levels.
- Monounsaturated fats (Oleic) are considered antithrombogenic, lowering LDL cholesterol and raising "good" cholesterol (HDL).
- Polyunsaturated fatty acids (PUFA) are generally antithrombogenic .
- Essential Fats (Linoleic and α-Linolenic) are fats the human body can't synthesis and must be consumed in the diet.
- Omega-3 Fats (α-Linolenic – fish and plant fats) are most beneficial to human health and lower LDL cholesterol.
- Omega-6 Fats (Linoleic – grains and vegetable oils) are antiatherogenic which reduces both LDL and HDL cholesterol .
- Health experts recommend lowering omega-6 FA in human diets, reducing the omega-6 to omega-3 FA ratio (n-6:n-3) to 4 or less. American diet general has 11 to 30 times more omega-6 then omega-3 FA.
- Conjugated linoleic acids (CLA) are unique trans fats to ruminants and have been linked to multiple biological functions including the inhibition of carcinogenesis, reduced rate of fat deposition, altered immune response, and reduced serum lipids.

Health implications of grass-fed beef compared to grain-fed beef:

- Pros: Reduced total fat, lower in bad saturated fats (Myristic & Palmitic), higher in neutral saturated fat (Stearic), lower Omega-6:Omega-3 ratio, Higher CLA content (up to 466%), higher concentrations of Vitamin E, Beta-carotene, and other antioxidants, and generally a significantly more favorable fat profile.
- Cons: Lower in monounsaturated fats (Oleic), mixed results of P:S ratio, on a per serving basis the differences in beneficial fats between grass- and grain-fed beef is minimal, cannot be considered a source of Omega-3 fats, with supplementation grain-feeding can produce similar results in fat profile.

Environmental implications of grass-fed beef:

- Grass-feeding: Extensive grazing systems, recycled nutrients, reduced runoff, reduced reliance on fossil fuels and chemicals, carbon sink of well managed perennial pastures, decreased animal performance may lead to increased methane emissions, local and regional marketing reduces carbon footprint.
- Grain feeding: Confined animal feeding operations lead to concentrated nutrients which increase water runoff and air pollution, and heavy reliance on fossil fuels and chemicals. However, efficiency due to high animal performance and integrated supply chain may reduce carbon footprint.

Production

There are three distinct phases of cattle production which require different management skills and forage quality:

- cow-calf (reproduction)
- stocker (muscle and bone deposition)
- finishing (fat deposition).

Finishing on grass requires:

- Consistent gains during animal's life, preferable over 2 lbs/day during stocker and finishing phase (no-compensatory gains).
- Utilize high quality forages in the finishing phase that are highly digestible and high in crude protein: legume and legume/grass mixes, annual forages (small grains, sudangrass, pearl millet, soybeans, cowpeas).
- Avoid forages that cause off-flavors in finishing diet: endophyte infected fescue, brassicas, wheat.
- Pastures must be well managed keeping forages in the vegetative state (rotational grazing).
- Utilize genetics of small to medium framed animals (low maintenance requirements), that are early maturing, efficient converters of grass to muscle/fat, and have the genetic capability for marbling.
- Low stress handling increases animal performance and meat tenderness.

Marketing

Most critical for determining profitability

Direct Marketing: CSA, Farmers Market, Halves, Quarters, Cuts

- Pros: Capture all the profits, direct connection with customers (loyalty), flexibility, start out small can reduce risk
- Cons: Requires high amount of labor and skill for marketing, high processing costs, challenging to establish a market
- Differentiate yourself: sell your story, labels, and certifications (American Grass-fed Association, Humane Treatment Certification, USDA Natural and Organic Certifications, Voluntary USDA Grass-fed Claim)
- Eatwild.com
- Local Harvest: www.localharvest.org
- Our Local Food: www.kawrivervalley.org

Cooperative Marketing:

- Pros: Increased market access with increased volume, shared marketing and knowledge
- Cons: Increased risk due to under-capitalization, lack of markets, lack of mid-size processors
- Annie Wilson's reflections on Tallgrass Prairie Producer's Co-op: www.kansasruralcenter.org → publications → Romance vs. Reality

Wholesale Marketing:

- Pros: Reduces marketing costs, allows for increased volume and ability to enter the market, improves access to national markets
- Cons: Strict protocols, unstable markets, prices not much better than conventional markets
- US Wellness Meats www.grasslandbeef.com / (877)383-0051
- Thousand Hills Cattle Company www.thousandhillscattleco.com/(507)263-4001
- Tallgrass Beef Company www.tallgrassbeef.com / (877 TBC-8283

Resources

Books:

Clancy, Kate. Greener Pastures: How grass-fed beef and milk contribute to healthy eating. Union of Concerned Scientists, 2006

Holder, Jan. How to direct market your beef. Beltsville, MD: Sustainable Agriculture Network, 2005.

Nation, Allen. *Grassfed to Finish: A production guide to Gourmet Grass-Finished Beef*. Ridgeland, MI: Green Park Press, 2005.

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Magazines:

Graze 'by graziers, for graziers'
www.grazeonline.com

The Stockman Grass Farmer
www.stockmangrassfarmer.net

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