

# Natural, branded programs



Galen Erickson



## Natural

"Minimally processed. No artificial ingredients. USDA permits no preservatives in this product."

## Organic

More stringent requirements  
Organic feeds, including grains required

## Branded Programs

Set their own requirements  
Numerous programs: no implants, no antibiotics

### Organic:

- Grown, handled and processed according to stringent (USDA) regulations.
- Livestock under continuous organic management.
- USDA National Organic Program standards [WWW.ams.usda.Gov/NOP/](http://WWW.ams.usda.Gov/NOP/)



## Conventional, Natural, Grass-Fed and Organic Beef: Fact Sheet

G.C. Smith, K.L. Hossner, T.E. Engle, K.E. Belk, J.A. Scanga, J.N. Sofos, T. Grandin, and J.D. Tatum

2006

**Table 1. Characterization of Conventional, Natural, Grass-Fed and Organic Beef**

	Conventional	Natural	Grass-Fed	Organic
<b>USDA definition</b>	<b>None</b>	<b>Minimal processing; no additives</b>	<b>Proposed</b>	<b>Must be "Certified"</b>
<b>Hormone implant use</b>	<b>Likely</b>	<b>May be</b>	<b>May be</b>	<b>Prohibited</b>
<b>Therapeutic antibiotics</b>	<b>Likely</b>	<b>May be</b>	<b>May be</b>	<b>Prohibited</b>
<b>Subtherapeutic antibiotics</b>	<b>Likely</b>	<b>May be</b>	<b>May be</b>	<b>Prohibited</b>
<b>Chemical fertilizer use</b>	<b>Likely</b>	<b>May be</b>	<b>May be</b>	<b>Prohibited</b>
<b>Chemical pesticide use</b>	<b>Likely</b>	<b>May be</b>	<b>May be</b>	<b>Prohibited</b>
Grazing	>70% of life	>70% of life	>80% of life	>80% of life
Confinement	<30% of life	<30% of life	<20% of life	<20% of life
Fed meat-and-bone-meal	Prohibited	Prohibited	Prohibited	Prohibited
Fed tallow	Allowed	Allowed	<1% of lifetime energy	Prohibited
Manure applied to land	Allowed	Allowed	Allowed	Mandated

SOURCE: Adapted from an article in Meat & Poultry (2000)

**Table 3. Residues of Pesticides & Compounds Specified for testing in FSIS-USDA ECD No. 90-22-EEC Req. for 1990 (Beef)**

	Conventional <sup>1</sup> Steers & Heifers	Natural <sup>2</sup> Steers & Heifers	Organic <sup>3</sup> Steers & Heifers	Chronically Ill <sup>4</sup> Steers & Heifers	Aged & Culled Cows <sup>5</sup>
Anabolics/Xenobiotics	0 of 128	0 of 48	0 of 48	0 of 48	0 of 48
Carazolol/Clenbuterol	0 of 56	0 of 21	0 of 21	0 of 21	0 of 21
Azaperone/Propiromazine	0 of 64	0 of 24	0 of 24	0 of 24	0 of 24
Lead	0 of 32	0 of 12	0 of 12	0 of 12	0 of 12
Cadmium	0 of 32	0 of 12	0 of 12	0 of 12	0 of 12
Sulfa-drug Antibiotics	0 of 192	0 of 72	0 of 72	0 of 72	0 of 72
Chlorinated Hydrocarbons	0 of 120	0 of 45	0 of 45	0 of 45	0 of 45
Organophosphates	0 of 80	0 of 30	0 of 30	0 of 30	0 of 30
<b>Composite</b>	<b>0 of 704</b>	<b>0 of 264</b>	<b>0 of 264</b>	<b>0 of 264</b>	<b>0 of 264</b>

SOURCE: Smith *et al.* (1992)

<sup>1</sup> Steers/heifers raised with the use of health/performance aids; pesticides can be used on land and livestock

<sup>2</sup> Steers/heifers raised with no health/performance aids; pesticides can be used on land and livestock

<sup>3</sup> Steers/heifers raised with no health/performance aids; no pesticides used on land and livestock

<sup>4</sup> Steers/heifers raised with the use of health/performance aids; pesticides can be used on land and livestock; slaughtered earlier than planned because they are chronically ill and not gaining weight in the feedlot

<sup>5</sup> Mature beef and dairy cows raised/maintained with use of health/performance aids; pesticides can be used on land and livestock

**Table 4. Violative Residues in Muscle and Fat (Combined) from Conventional, Natural and Organic Beef**

Chemicals Tested	Number of positive samples, of total samples tested		
	Conventional	Natural	Organic
Anabolic Steroids; Beta-Agonist (N=5)	0 of 30	0 of 30	0 of 80
Heavy Metals (N=2)	0 of 12	0 of 12	0 of 32
Stress Reducers (N=3)	0 of 18	0 of 18	0 of 48
Sulfa Drugs (N=6)	0 of 36	0 of 36	0 of 96
Chlorinated Hydrocarbon & Organophosphate Pesticides (N=20)	0 of 75	0 of 75	0 of 200
<b>TOTAL</b>	<b>0 of 171</b>	<b>0 of 171</b>	<b>0 of 456</b>

SOURCE: Smith *et al.* (1994)

**Table 5. Violative Residues in Muscle and Fat (Combined) from Conventional and Natural Beef**

Chemicals Tested	Number of positive samples, of total samples tested	
	Conventional	Natural
Anabolic Steroids (N=2)	0 of 36	0 of 36
Heavy Metals (N=5)	0 of 90	0 of 90
Antibiotics (N=5)	0 of 90	0 of 90
Sulfa Drugs (N=6)	0 of 180	0 of 180
Polychlorinated Biphenyls (all)	0 of 18	0 of 18
Parasiticides (N=3)	0 of 54	0 of 54
Pentachlorophenol (wood fungicide)	0 of 18	0 of 18
Chlorinated Hydrocarbon & Organophosphate Pesticides (N=20)	0 of 360	0 of 360
<b>TOTAL</b>	<b>0 of 774</b>	<b>0 of 774</b>

SOURCE:Usborne (1994)

**Table 6. Violative Residues in Muscle and fat (Combined) from Conventional, Natural, and Organic Beef**

Chemicals Tested	Number of positive samples, of total samples tested		
	Conventional	Natural	Organic
Anabolic Steroids (N=3)	0 of 90	0 of 95	0 of 95
Xenobiotic Steroids (N=3)	0 of 90	0 of 95	0 of 95
Tetracycline Antibiotics (N=3)	0 of 90	0 of 95	0 of 95
Beta-Lactam Antibiotics (N=3)	0 of 90	0 of 95	0 of 95
Sulfa Drugs (N=4)	0 of 120	0 of 126	0 of 126
Chlorinated Hydrocarbon & Organophosphate Pesticides (N=25)	0 of 750	0 of 787	0 of 787
<b>TOTAL</b>	<b>0 of 1,230</b>	<b>0 of 1,293</b>	<b>0 of 1,293</b>

SOURCE: Smith *et al.* (1997)

**Table 7. Daily endogenous hormone production in relation to amounts ingested**

	Nanograms (billionths of a gram)		
	Estrogen	Testosterone	Progesterone
Pre-pubertal girl, daily	54,000	32,000	250,000
Pre-pubertal boy, daily	41,500	65,000	150,000
Adolescent girl, daily	93,000		
Non-pregnant woman, daily	480,000	240,000	10,100,000
Pregnant woman, daily	3,415,000	435,000	294,000
Normal adult man, daily	136,000	6,400,000	410,000
<b>3 oz steak from non-implanted animal</b>	<b>1.3</b>	<b>0.3</b>	<b>0.3</b>
<b>3 oz steak from implanted animal</b>	<b>1.9</b>	<b>0.6</b>	<b>0.5</b>
3 oz milk	11		
3 oz potatoes	225		
3 oz peas	340		
3 oz ice cream	520		
3 oz cabbage	2,016		
3 oz hens eggs	2,625		
3 oz wheat germ	3,400		
3 oz soybean oil	1,680,000		

**Pregnant Heifer 21.9 – 55.6 ng**

SOURCES: Hoffman and Evers (1986); Scanga *et al.* (2004); FSIS-USDA (1994)

## Androgen Content Meat

Food	Androgen (ng/portion)
Bull	1,560
Steer implanted w/TBA	135
Heifer implanted w/TBA	150

“Results of currently available data comparing conventional, natural, grass-fed and organic beef do not support claims of nutritional compositional differences in quantities that would be of consequence to consumers.”

Smith *et al.*, 2006

## Summary

- There are big differences in requirements to qualify for natural versus organic
- There is no evidence of improper residues of pesticide, antibiotics, or hormones
- There are no compositional differences of nutritional significance

## Conclusion

From a health perspective, there are no differences in beef from conventional, natural, and organic programs

BUT,

## Natural-Organic-Conventional

What is the program?

Are economics favorable?

Compare costs of removing technology

cow-calf: implants and treatment  
feedlots: Implants, Rumensin,  
Tylan, MGA;

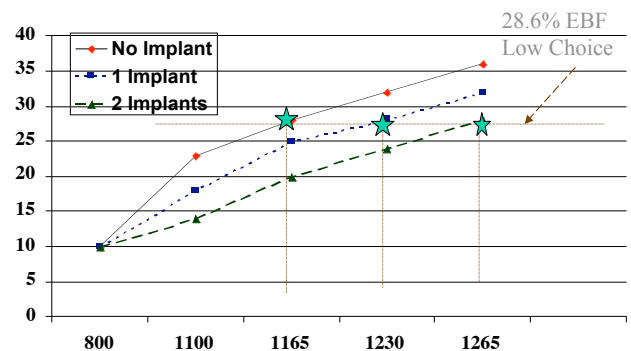
- Flexibility in feedlots?
- Handling sick animals?
- Diets require change



## Implants and Body Composition

- Implants increase protein deposition.
- Implants cause a upward shift in the growth curve.
- The shift in the growth curve influences body composition at a given weight.

## Implants Change the Growth Curve



## Implant impact on BW 28% EBF - Steers

	Weight @ 28% Fat	Increase
• Non-implanted	1145	
• Rev-IS	1175 <sup>a</sup>	+30
• Component-ES		
• Ralgro/Rev-S	1212 <sup>b</sup>	+67
• Revalor-S 1 x		
• Syn-S/Rev-S	1223 <sup>c</sup>	+78
• Rev-IS/Rev-IS		
• Rev-IS/Rev-S	1237 <sup>d</sup>	+92
• Rev-S/Rev-S		

Guiroy et al., 2002

## Implant impacts

	none	revalor-S	Diff	%change
N	1040	1040		
DOF	135	135		
ADG	3.18	3.79	0.61	19.2
F:G	6.62	5.92	-0.7	-10.6
HCW	727.6	779.2	51.6	7.1
FW	1155	1237	82	7.1
% Choice	75.0	63.7	-11.3	-15.1

Intervet and Texas Tech Implant database:  
<http://idb.afs.ttu.edu/dbhome/default.htm>

## Economics for implants

	none	implanting	assumption
N	100	100	
Sell weight	-	8000 lb	80lb/hd more
\$70	-	\$5,600	
\$80	-	\$6,400	
\$90	-	\$7,200	

## Economics for implants

	none	implanting	assumption
N	100	100	
Sell weight	-	8000 lb	80lb/hd more
\$70	-	\$5,600	
\$80	-	\$6,400	
\$90	-	\$7,200	
%choice	15 hd		800 lb carcass
\$2/cwt spread	240	-	
\$6/cwt spread	720	-	
\$15/cwt spread	1800	-	
\$22/cwt spread	2640	-	
Implant & work	800	-	

## Economics for implants

	none	implanting	assumption
N	100	100	
Sell weight	-	8000 lb	80lb/hd more
\$70	-	\$5,600	
\$80	-	\$6,400	
\$90	-	\$7,200	
%choice	15 hd		800 lb carcass
\$2/cwt spread	240	-	
\$6/cwt spread	720	-	
\$15/cwt spread	1800	-	
\$22/cwt spread	2640	-	
Implant & work	800	-	
\$/made	1040-3440	5600-7200	\$40.80/hd today: \$61.60

## Feed Additives

**Ionophores-** Rumensin, Bovatec, Cattylist,  
Gainpro, Vmax

**Coccidiostats-** Deccox, Amprolium

**Antibiotics**

**Hormone-** MGA

**\_agonists**

**Parasites**

## Rumensin Performance

### Four Trial Summary (2,904 Steers)

	DM Intake	Daily Gain	Feed/Gain
<b>Deads Out</b>			
Control	19.4	3.20	6.08
Rumensin	19.1	3.25	5.89
	-1.5%*	1.6%*	3.1%*
<b>Deads In</b>			
Control	19.4	3.13	6.21
Rumensin	19.1	3.21	5.97
	-1.5%*	2.6%	3.9%*

Source: Laudert, 1990

Cooper slides, 2004

Rumensin improves F:G by 4%

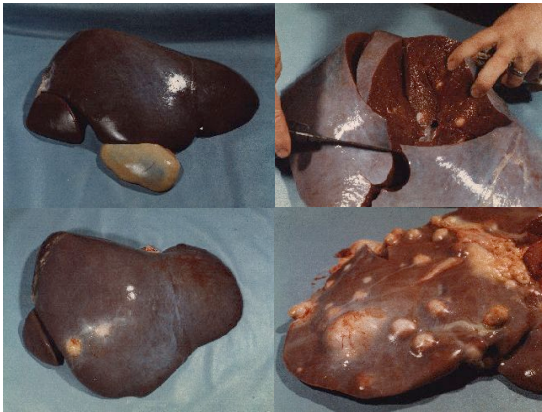
1% change in F:G improves \$2.80/hd range \$2.50 to \$3.00

Therefore: \$10.00 to \$12.00 return from performance  
Cost: 2 cent/hd/d: approximately \$3.00

**RUMENSIN SAVE: range: \$7.00 to \$9.00**

1996 Scientific Update, Elanco Animal Health; Laudert, 1990

## Liver Abscesses



Elanco Animal Health

## Tylan

	none	Tylan	%change
Trials	40	40	
DOF	134	134	
ADG	2.84	2.90	2.1
F:G	6.72	6.90	-2.6
Liver abscesses	27.9	7.5	
Dressing %	61.65	61.80	

Elanco Animal Health Technical Bulletin; Laudert and Vogel

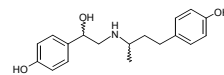
## Tylan Economics

	none	Tylan	%change
F:G	6.72	6.90	-2.6

1% change in F:G improves \$2.80/hd range \$2.50 to \$3.00

Therefore: \$6.50 to \$7.80 return from performance  
Cost: 1 cent/hd/d: approximately \$1.50

**TYLAN SAVE: range: \$5.00 to \$6.30**



## Optaflexx Expected Response

Steers	100	200	300
Increase in live wt	10	17	21
Increase in carcass wt	6	14	18
Calculated return, \$/hd			
Price at \$80/cwt live	6.30	6.60	4.50
Price at \$70/cwt live	4.20	4.90	3.50

Steers only, fed 28 days and ~\$7.00 for Optaflexx fed at 200 mg/hd

Current Elanco recommendation: 200 mg/hd for 28 d.

## Summary

Implants:	\$62	20-70
Rumensin:	\$8	7-9
Tylan:	\$5.65	5-6.30
MGA <sub>(heifers)</sub> :	\$7	5-8
Sick cattle:	?	
Lower energy:	\$10	

## Summary

Implants:	\$62	45-90
Rumensin:	\$8	7-9
Tylan:	\$5.65	5-6.30
MGA <sub>(heifers)</sub> :	\$7	5-8
Sick cattle:	?	
Lower energy:	\$10	
TOTAL:		<u>\$75.65</u>

## Conclusions

Is conventional beef production bad?  
no evidence of a difference in beef

Providing a higher-cost niche market  
consumer perception

Be sure of appropriate compensation!  
> \$100 (i.e., \$12.50/cwt of carcass)  
watch sick cattle (implant when treat)  
purchase price higher?

## Cow-calf Breakeven

Probably okay without many technologies  
Implants and lower weight  
Sick calves?

Implants increase wean weight by 25 lb  
25 lb is worth \$1.15 at 600 to 625 lb = \$28.75  
Therefore, need \$4.80 more per cwt for a 600 lb calf

If yes, sell natural  
If no, sell conventional and implant

## Feedlot Breakeven

Purchase price + feed cost + yardage + processing +  
interest + death (sick)

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Sale weight

Factors to watch:

lower finished weights  
increased feed cost (i.e., higher F:G)  
purchase price higher  
sickness?

UNIVERSITY OF  
**Nebraska**  
Lincoln



CONTACTS:

Galen Erickson  
402 472-6402; [geericks@unlnotes.unl.edu](mailto:geericks@unlnotes.unl.edu)  
<http://beef.unl.edu>

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