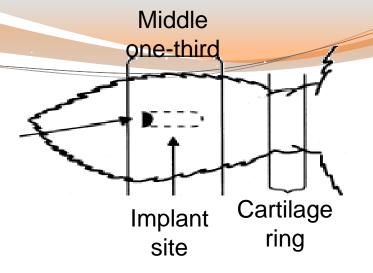
Implants and Their Use in Beef Cattle Production

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What are implants?

Needle insertion site



- Natural or synthetic anabolic compounds
- Manufactured in slow release systems
- Placed in back of ear under skin
- Enhance the efficiency and growth of cattle
- Effective days: 70 to 350, most 100 to 120







Compounds Used

- Estrogenic
 - Estradiol benzoate
 - Estradiol 17-beta
 - Zeranol

- Androgenic
 - Testosterone propionate
 - Trenbalone acetate (TBA)
 - Synthetic progesterone



Times to implant

- Nursing
 - At branding with vaccinations and deworming
 - 30 or 45 days to 4 months
- > 400 lb
 - If weaning at least 45 days or backgrounding
 - 2 to 6 weeks prior to weaning
 - Weaning
 - Tie to brand, vaccinate, deworm
 - 14 days post weaning
- Stocker phase
- Finishing
 - Arrival
 - Final diet
 - Up to ~70 pre harvest



Table 1. Implants available for Stocker Calves.

Approved Uses						Company			Anobolic Compound		
Suckling Calves <400lbs		Stockers >400 lbs		Feedlot Confinement							-
Steer	Heifer	Steer	Heifer	Steer	Heifer	Elanco®	Merck®	Zoetis®	Estrogenic (mg)	Andogenic (mg)	Payou (Days
X	X					Component® E-C			7.2	0.0	120
		X		X		Component® E-S			14.4	0.0	120
			X		X	Component® E-H			14.4	200 Testosterone	120
		X	X			Component® TE-G			8.0	40 TBA	120
X		X		X	X	Encore®			43.9	0.0	336
X		X		X	X	Compudose®			25.7	0.0	168
					X	Component® T-H			0	200 TBA	105
				X	X	Component® TE200			20	200 TBA	120
				X		Component® TE-S			24	120 TBA	120
				X		Component® TE-IS			16	80 TBA	120
				X		Component® T-S			0	140 TBA	105
X	X	X	X	X	X		Ralgro®		36 Zeranol	0	90
				X		R	algro® Magnun	n	72 Zeranol	0	90
					X		Finaplix® H		0	200 TBA	105
					X		Revalor® H		14	140 TBA	120
				X			Revalor® IH		8	80 TBA	120
		X	Х				Revalor® G		8	40 TBA	120
				X			Revalor® S		24	120 TBA	120
				X			Revalor® IS		16	80 TBA	120
				X	X		Revalor® 200		20	200 TBA	120
				X			Revalor® XS		40	200 TBA	240
X	X			X				Synovex® C	7.2	0	120
			X		X			Synovex® H	14.4	200 Testosterone	120
	X		X					Synovex® S	14.4	0	120
				X				Synovex® Choice	10	100 TBA	12
				X	X			Synovex® Plus	20	200 TBA	120

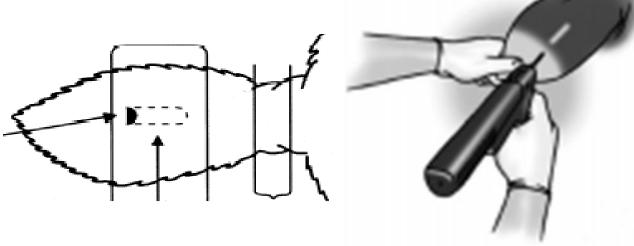




Implant Procedure

http://beefextension.com/pages/scmang.html





Expected Response from Implants: Nursing Calves

- Review of 50 studies comparing non-implanted suckling steers to implanted suckling steers: + 0.1 lb/d
- Review of 8 studies comparing non-implanted suckling heifers to implanted suckling heifers: + 0.12 lb/d

Selk, 1997



Heifers

- Heifers can be implanted one time between 45 DOA and weaning with no adverse effects on replacements
- Alternative program
 - Implant heifers born during 2nd half of the calving season



Stockers

- 8- 20% improvement
 - Average10-15%
 - 0.18 to 0.27 lb per day





Feedlot

- o.35 lb/d steers
- o.25 lb/d heifers
- Improve feed efficiency o.5 lb/lb gain
- Aggressive programs
 - 21% improvement in gain
 - 11% improvement in feed conversion

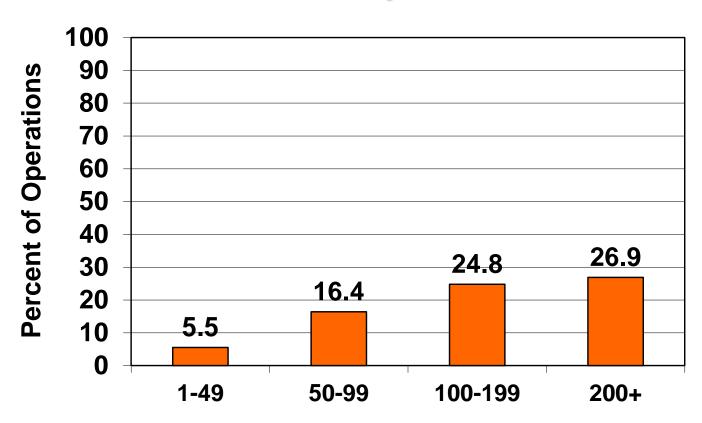
If harvested at same wt

- Increase carcass wt & Rib eye area
- Decreases marbling scores
 - Reduced Ch by 2-24%





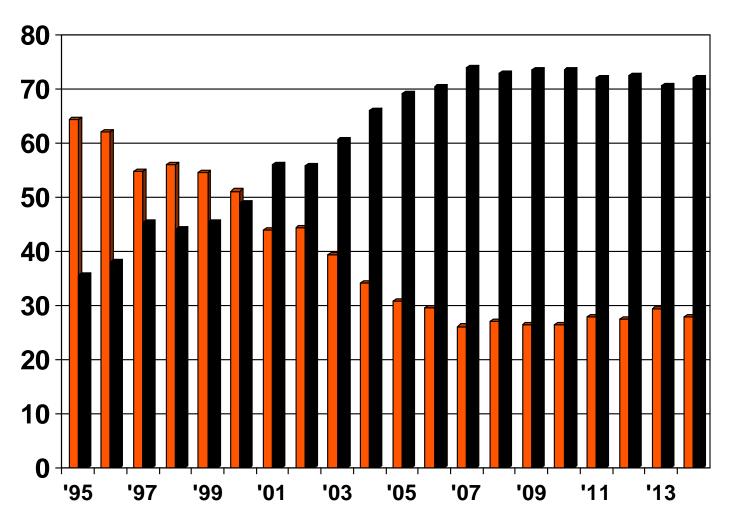
"Current" Use of Implants Cow/Calf





Percentage Lots Implanting / Not Implanting

Superior Livestock, 1995-2014



Implant
■ No Implant



Food (3 0z or 85 gram serving)	Estrogenic Activity (nanograms of estrogen)						
Beef from non-implanted cattle	1.4						
Beef from implanted cattle	1.9						
Milk	11.1						
Beef from pregnant cow	119						
Potatoes	225						
Peas	340						
Ice cream	510						
Eggs	2,635						
Wheat Germ	3,400						
Soybean Oil	168,000						
Human estrogen production (nanograms / day)							
Girls	54,000						
Boys	41,500						
Non-pregnant woman	480,000						

136,000

Adult Male

How many servings of implanted beef do you have to consume to equal a serving of potatoes? (3 oz servings)

- A) 12 (4 lbs)
- B) 48 (12 lbs)
- C) 72 (18 lbs)
- D) 120 (30 lbs)
- E) 240 (60 lbs)

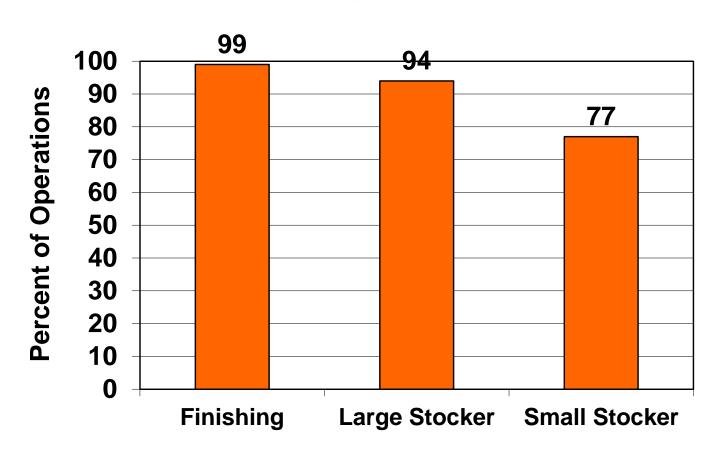


So Why the Decline?

- Increased hormones in beef
- Consumers want non-implanted beef

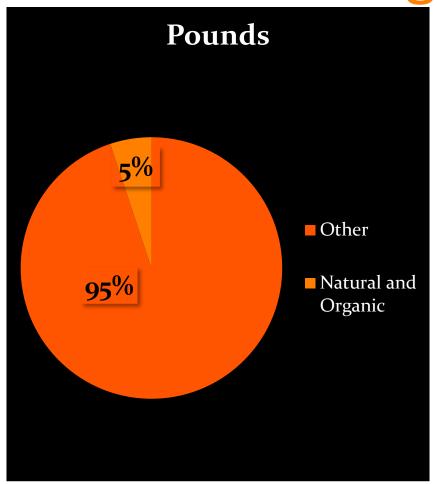


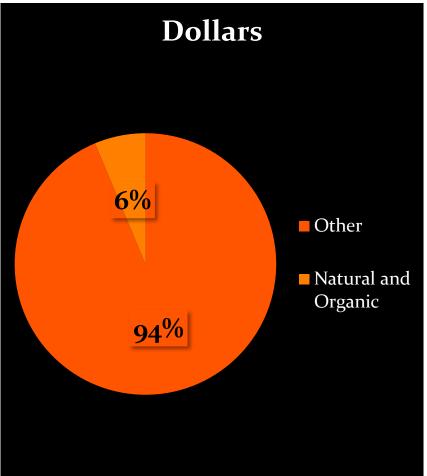
"Current" Use of Implants Finishing and Stocker





Natural and Organic Beef Sales





Source: FreshLook Marketing Data 13 weeks

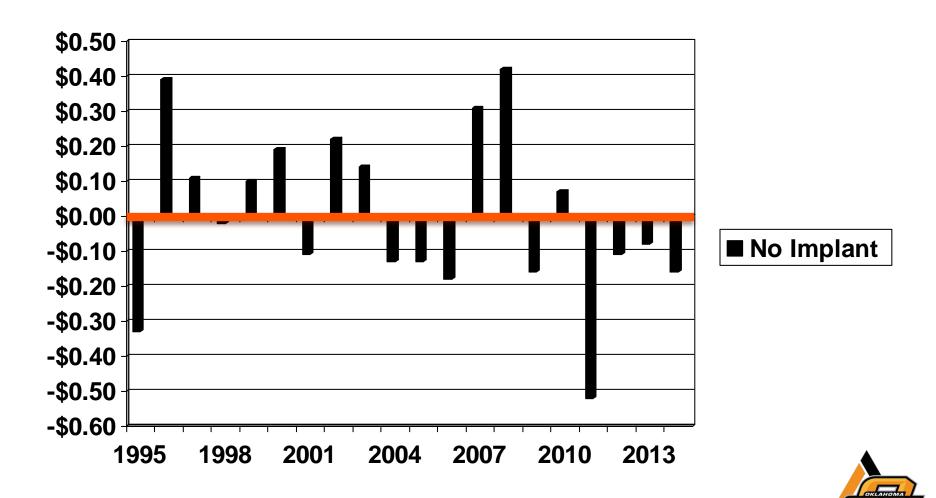


So Why the Decline?

- Increased hormones in beef
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- Gaining premiums / avoiding discounts



Price Advantage for Not Implanting Superior Livestock, 1995-2014



So Why the Decline?

- Increased hormones in beef
- Consumers want non-implanted beef
- Gaining premiums / avoiding discounts
- Implanting skills have declined or lost



Training opportunity

- On Farm
 - implants can be applied to individual animals
 - Calves can be managed as a single group
 - Pair calves by sex, weight, and birthdate
 - Implant half of the calves

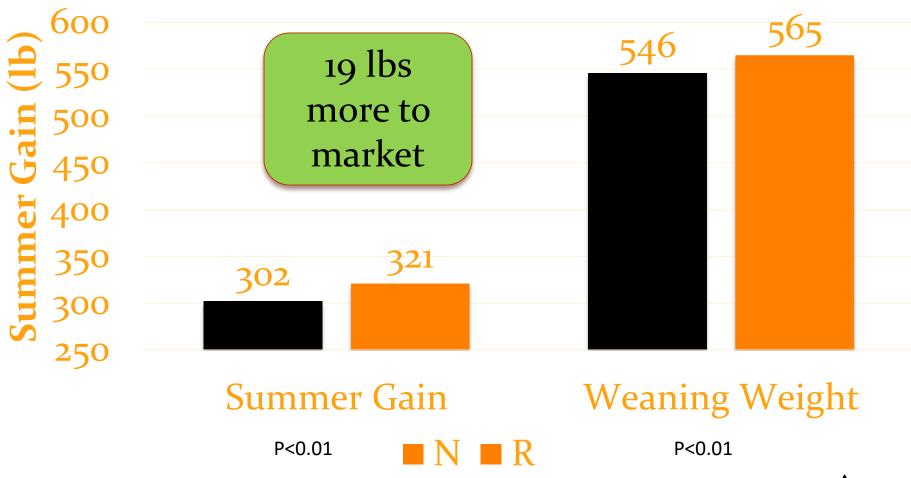


So Why the Decline?

- Increased hormones in beef
- Consumers want non-implanted beef
- Gaining premiums / avoiding discounts
- Implanting skills have declined or lost
- They do not work anymore

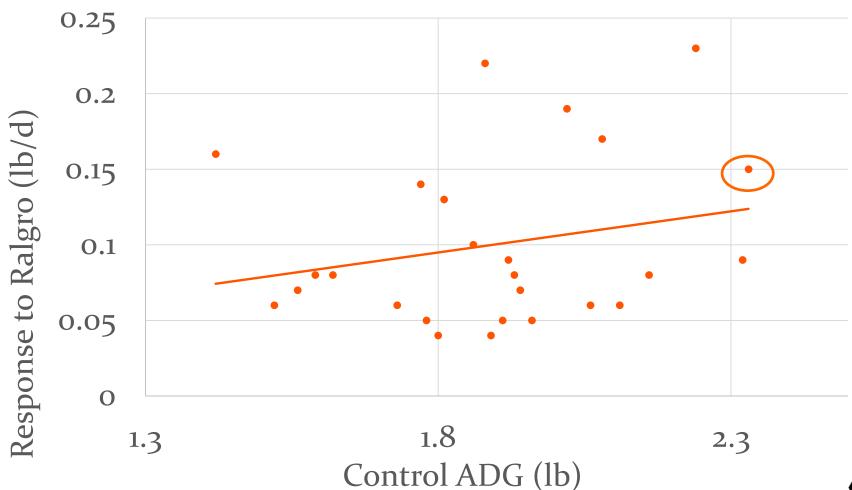


2014 Implant Study, OSU Cow/Calf





Implant response over control ADG





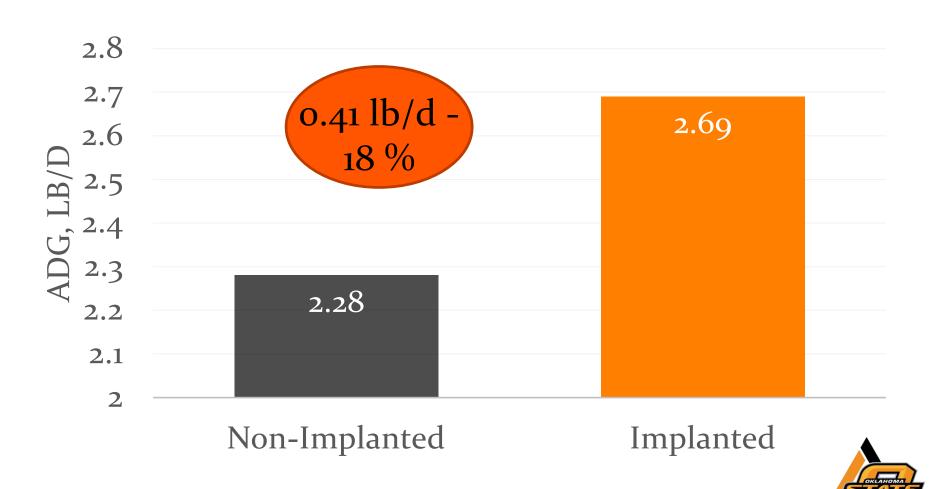
Oklahoma example

• What are the production and economic differences between natural and traditional beef production?

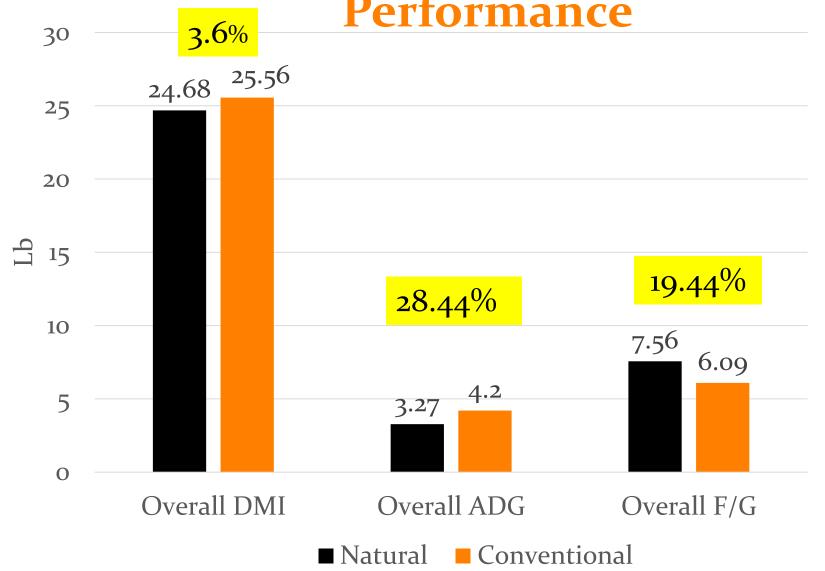




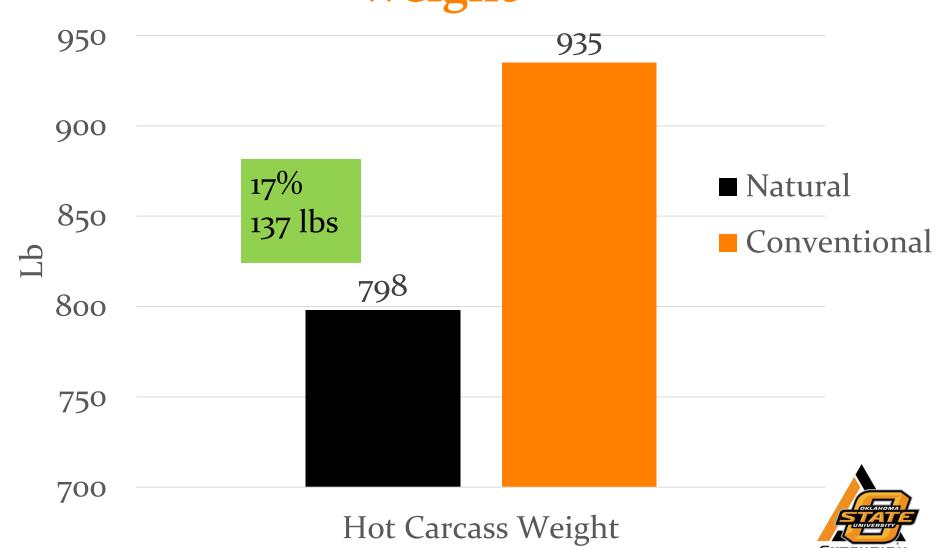
Implants on Pasture ADG



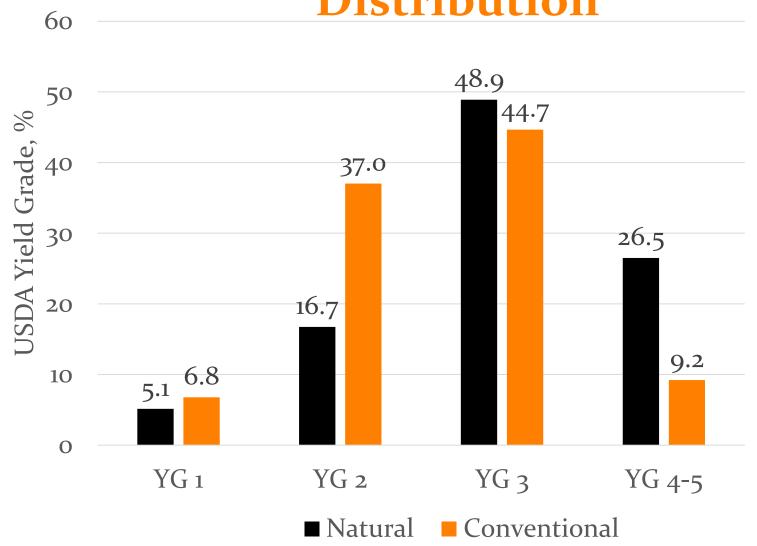
Feedlot System: Overall Feedlot Performance



System Effect: Hot Carcass Weight

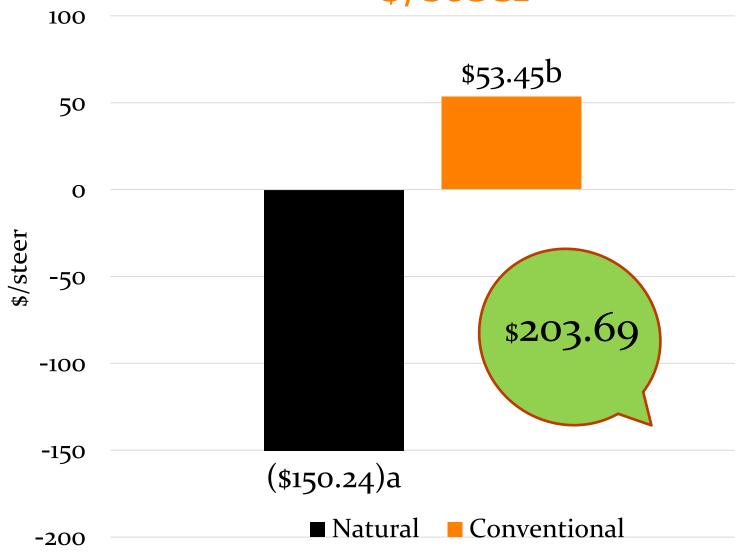


System Effect: USDA Yield Grade Distribution





Net Return W/O premiums, \$/steer





Implications

- "Natural" type programs
 - Calf producers would need to receive ~10 lbs. worth of premium
 - Stockers would need to receive ~45 lbs. worth of premium plus any cost of program enrolment
 - Finished cattle can be produced with ~\$200 of premiums
 - Higher quality grade distribution
 - Feeds approximately 7.6 US Citizens for 1 year
- Technology used
 - 44 lbs more gain on pasture
 - 119 lbs more feed resulted in 126 lbs more weight gain
 - 135 pound of carcass advantage
 - Better YG distribution



So Why the Decline?

- Increased hormones in beef
- Consumers want non-implanted beef
- Gaining premiums / avoiding discounts
- Implanting skills have declined or lost
- They do not work anymore
- Natural is good for the environment



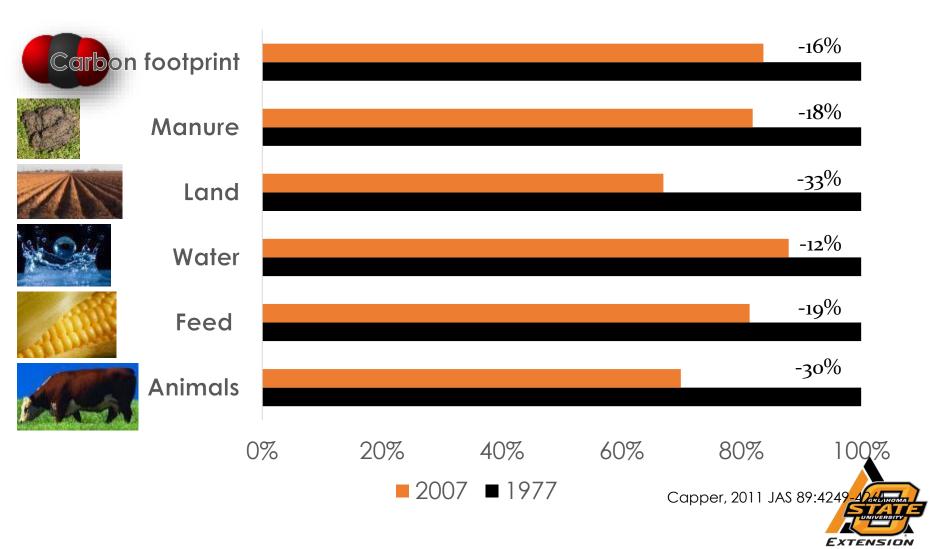
Implications: Technology

- Technology in 1 Steer
 - Feeds 1 1/4 more US Citizen for 1 year
 - •17% increase

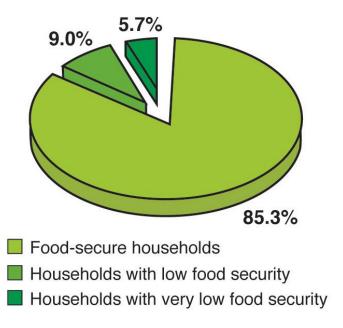


Historical context

Production efficiency: More with less

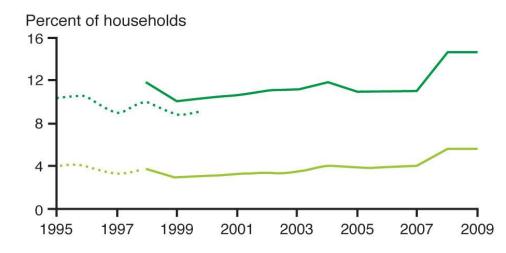


Food security status of U.S. households, 2009



Note: Food-insecure households include those with low food security and very low food security.

Trends in prevalence rates of food insecurity and very low food security in U.S. households, 1995–2009



- Food insecurity, unadjusted*
- ··· Food insecurity, adjusted for comparability in all years
- Very low food security, unadjusted*
- ··· Very low food security, adjusted for comparability in all years

^{*}Data as collected (unadjusted) in 1995–97 are not directly comparable with data collected in 1998 and later years.



TOTAL HEAD OF CATTLE













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