

Economic Issues in Managing Infectious Disease Risks

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Production Impacts

- **Death**
- **Permanent Damage**
- **Uncompensated Growth Interruption**
- **Reduced Feed Efficiency**

Production Impacts

- **Abortion**
- **Reproductive Inefficiency**
- **Decreased Animal Product Output**
- **Increased Culling**

Cost of Disease

- **Mortality**
 - Value, expenses, and disposal
- **Morbidity**
 - Production, efficiency, cash flow
- **Revenue loss**
 - Lower weight & value, condemn

Cost of Disease

- **Prevention and/or treatment**
- **Seedstock suppliers**
 - Lost market
 - Reputation/goodwill
- **Industry impact**
 - Export market, consumer confidence

Budgeting Economic Impact of Disease

- **Reduced Revenue**
- **Reduced Costs**
- **Increased Costs**

Purchased Feeder Cattle

Trenkel: Precondition effect

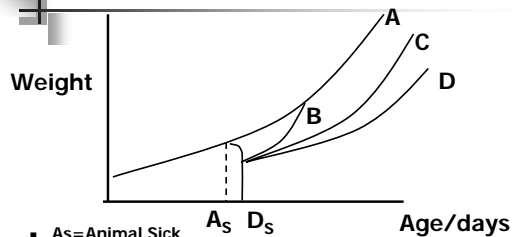
	Preconditional	Not PC
DOF	258	278
Pulls-treat	2%	47%
Retreats	0%	25%
Treat \$/hd	1.48	6.13

Purchased Feeder Cattle

Faber, et al. 10 years of steer test data, 1988-1997, BRD effect

	Treated	Non-treated
Fatality	.35%	5.9%
Sale value	840	793
BRD treatment	\$0	\$20.60
Profit \$/hd	\$61	\$3

Impact of Disease on Market Cattle Growth

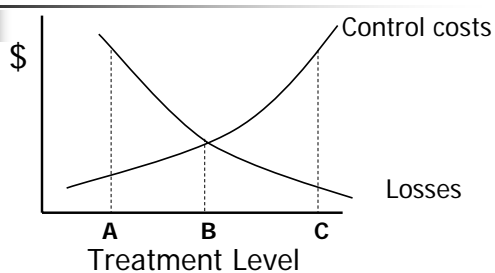


- As=Animal Sick
- Ds=Days Sick
- A=Normal growth
- B=Compensating growth
- C=Growth resumes but no compensating gain
- D=Growth is impacted through days on feed.

Economics

- Evaluating trade-offs
 - Prevention v. treatment
- Marginal analysis
 - What is the value of additional intervention versus its cost
 - Optimal is when they are equal

Relationship of Treatment Level and Losses



- A=Allow disease to go to higher level and then treat
- B=Keep incidence at medium level
- C=Keep incidence at low level-treat often

Cost of Biosecurity

- Investment
 - Facilities, equipment, space
- Expenses
 - Testing, vaccination, limit choices
- Management
 - Protocol, clean and disinfect, isolation, health records

Issues in Disease Management Biosecurity

- Economic Impact on the Herd/Operation
- Impact on Management of Animal Flow or System
- *Need to have a focus on what the it causes as well as what causes it.*

Disease Management is site specific -

Depends on:

- Farm Type
- Production Level
- Investment
- Disease Costs

Disease Management is Dynamic

- Disease management can vary from situation to situation.

Issues in Disease Management Biosecurity

- Cost of Prevention
- Cost of Treatment
- Prevention Effectiveness
- Treatment Effectiveness
- Probability of Getting Disease
- Disease Contagiousness

- Can't afford total prevention. It will bankrupt you.

Evaluating Trade-offs

Cost to Farm	Treatment Effectiveness	
	High	Low
High	Treat	Prevent
Low	Treat/Ignore	Prevent/Ignore

Evaluating Trade-offs

Cost to Farm	Probability of Disease	
	High	Low
High	Prevent	Prevent/Treat
Low	Treat/Prevent	Ignore

Evaluating Trade-offs

Cost to Farm	Cost of Treatment	
	High	Low
High	Prevent	Treat/Prevent
Low	Prevent/Treat	Treat/Ignore

Evaluating Trade-offs

Variables	Treatment	Prevention
Incidence	More important for low incidence	Important for high incidence
Infections	Less important	Important
Clinical	Important	Less important
Sub-Clinical	Less important	Important
Lead to other disease	Less important	Important
Contact Transfer	Important	Less important
Air Transfer	Less important	Important



Summary

- **Economics of disease and biosecurity**
 - Trade-offs
 - Marginal analysis
 - Site-specific disease-specific
- **Develop array of best management practices**
- **Prevent, treat, live with it**
- **Investment or expense**
