

2007
Science
Week



Is the eradication
of animal diseases set to
become a curiosity of
history?

Tony Higgs

Overview

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Topics to be covered

- What is eradication?
- Why would we want to eradicate?
- What criteria do we need to satisfy before commencing eradication?
- Some reflections on past campaigns
- Review of a current campaign
- Some thoughts on the future including the role of epidemiologists.

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Definitions of eradication

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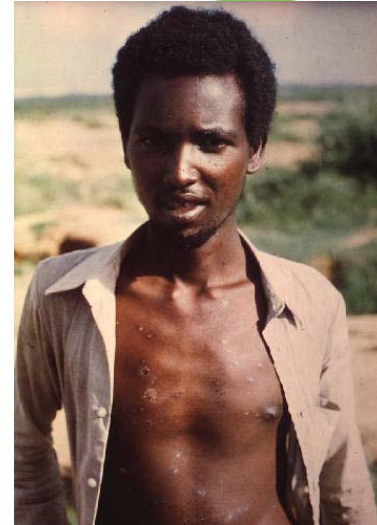
Eradication may mean

- ***total elimination***

Definitions of eradication

Eradication may mean

- ***total elimination***



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Last case of
small pox ..?

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Definitions of eradication

Eradication may mean

- ***total elimination***

or

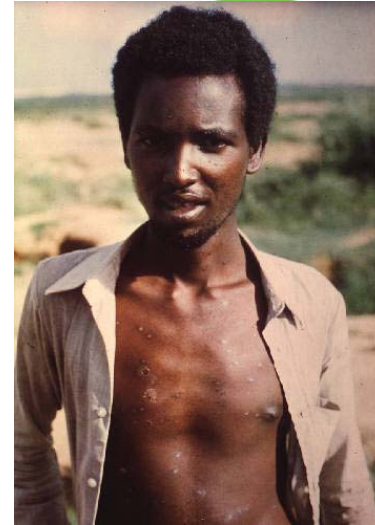
- ***regional elimination***

or

- ***transmission no longer occurs***

or

- ***no longer a major health problem***



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Last case of
small pox ..?

Benefits of Eradication

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Why eradicate?

- Obvious end point
- On-going savings
- Motivating for staff (vs control)
- Removes the need for any further action
- Inherently a more attractive option.

Criteria for eradicability

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Scientific Feasibility

- Epidemiologic vulnerability
- Effective and practical intervention available
- Demonstrated feasibility of eradication

Political Will / Popular Support

- Perceived burden of the disease
- Expected cost of eradication
- Synergy of efforts with other interventions
- Necessity for eradication vs control.

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Criteria for animal program

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1. Economic justification
2. Knowledge of cause and spread
3. Ability to detect and diagnose
4. Removal of infected animals
5. Prevent infection and re-infection
6. Sources of disease free stock
7. Effective animal health services
8. Legislation and compensation
9. Industry and community support
10. Financial support.

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Reflections on past campaigns

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Small Pox

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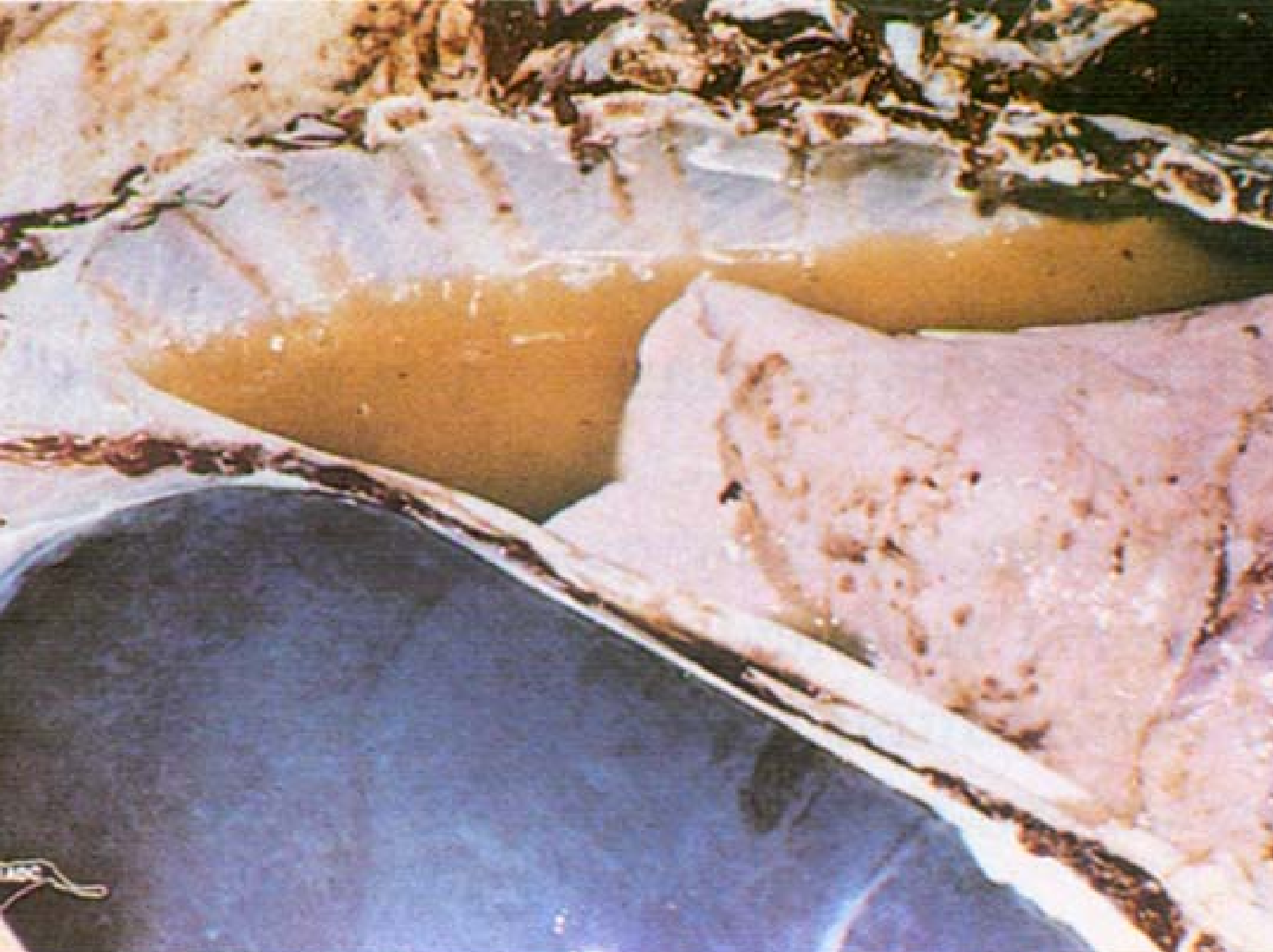
Successful Campaign because:

- Virus produced acute illness (very visible)
- No carrier stage or non-human reservoirs
- Effective vaccine available
- International surveillance
- Public education









Contagious Bovine Pleuro-pneumonia

- Entered Aust in 1858
- Considered eradication 1958
- Commenced eradication 1961
- Last case 1967
- Declared free 1973.

Contagious Bovine Pleuropneumonia

- Easy to diagnose clinically
- Effective vaccine
- Economic impact significant
- Compensation available
- Eradication demonstrated (in NZ 1870).



Brucellosis and Tuberculosis

- Introduced with first fleet in 1788?
- Commenced national campaign 1970
- Tasmania TB free 1975
- Australia free of bovine brucellosis 1989
- TB Free Status 1997.

Bovine TB eradication

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Significant challenges:

- Often does not produce acute disease
- Persists in the carrier stage
- Easily crosses to other species
- No effective vaccine
- Control measures result in significant economic losses.

Time scale

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CBPP eradication



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Time scale

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CBPP eradication

Start

Last
case

Declared
Free

BTEC
Start

1961

1967

1970

1973

BTEC

Brucellosis
Declared
Free

Tuberculosis
Declared
Free

1989

1997

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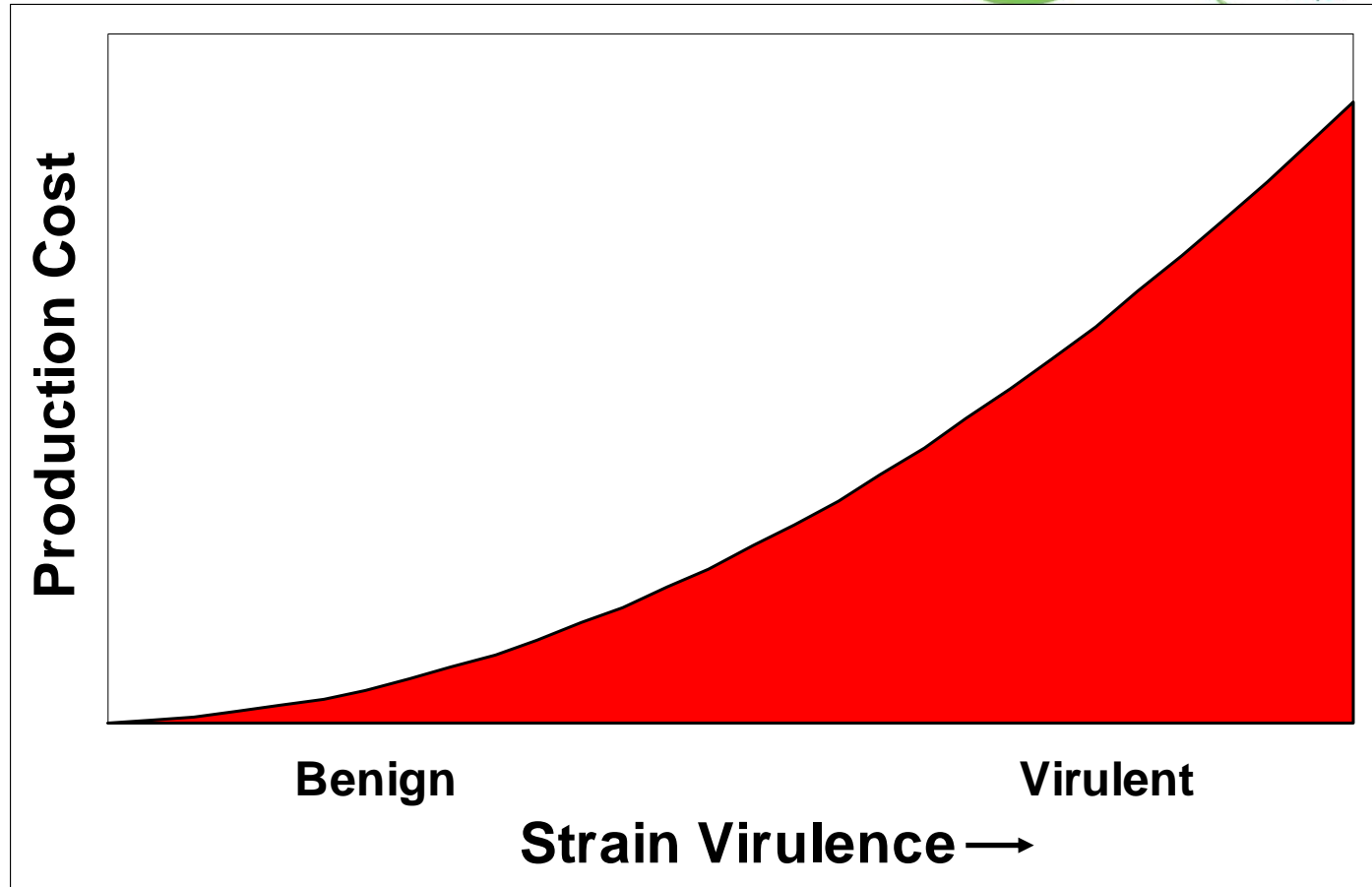
Review of a current campaign

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History of Footrot in WA

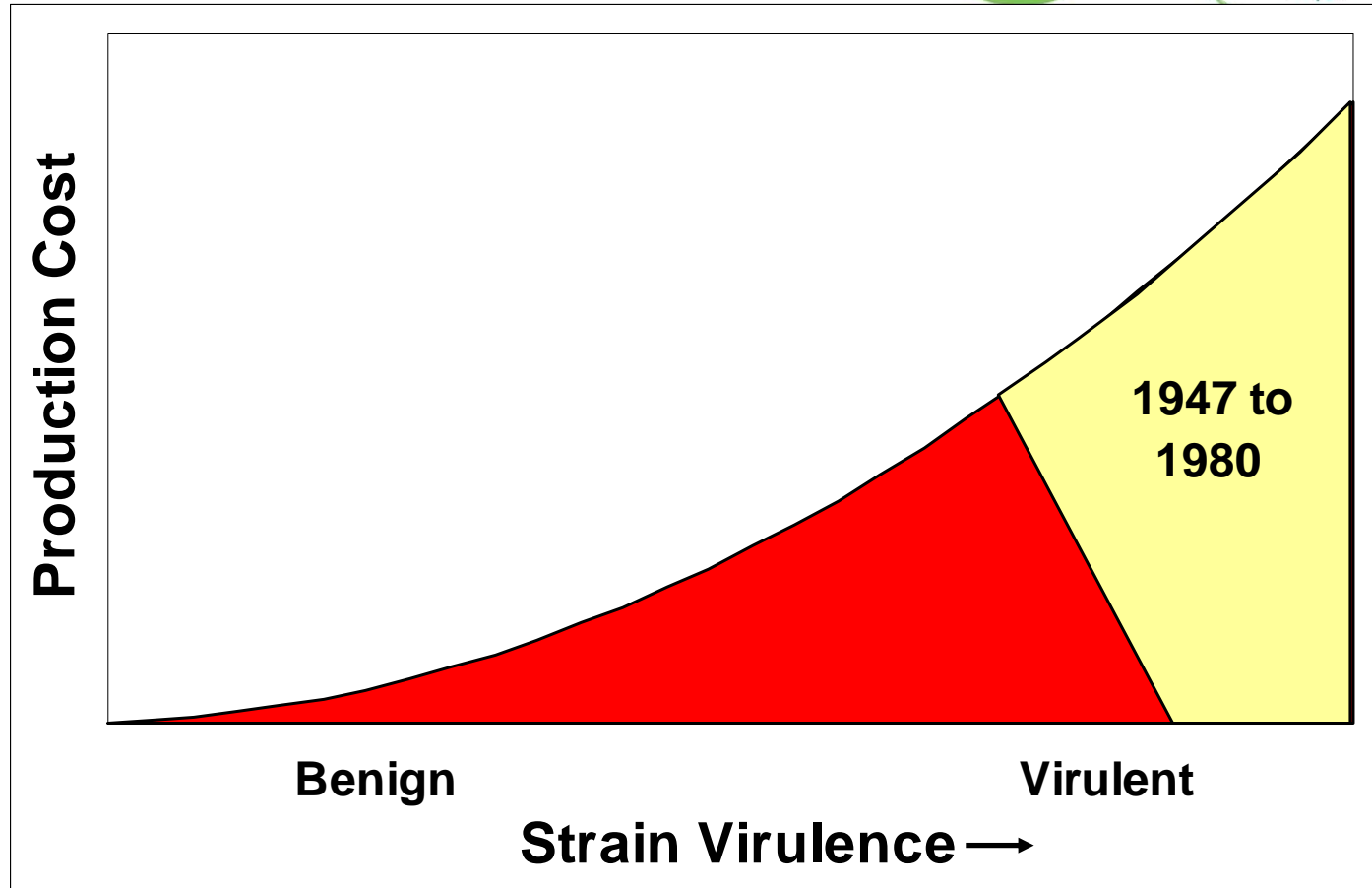
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History of Footrot in WA

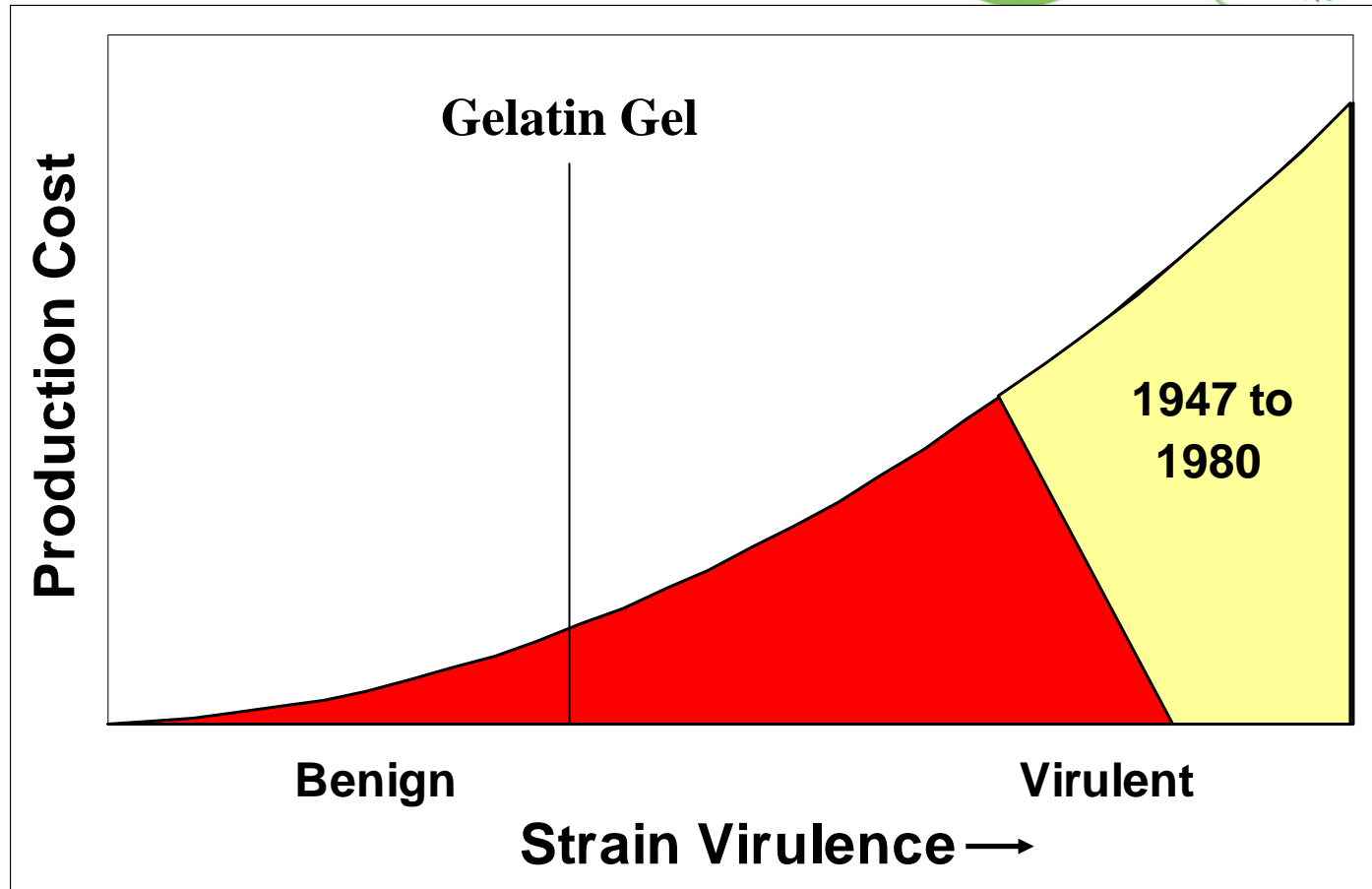
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History of Footrot in WA

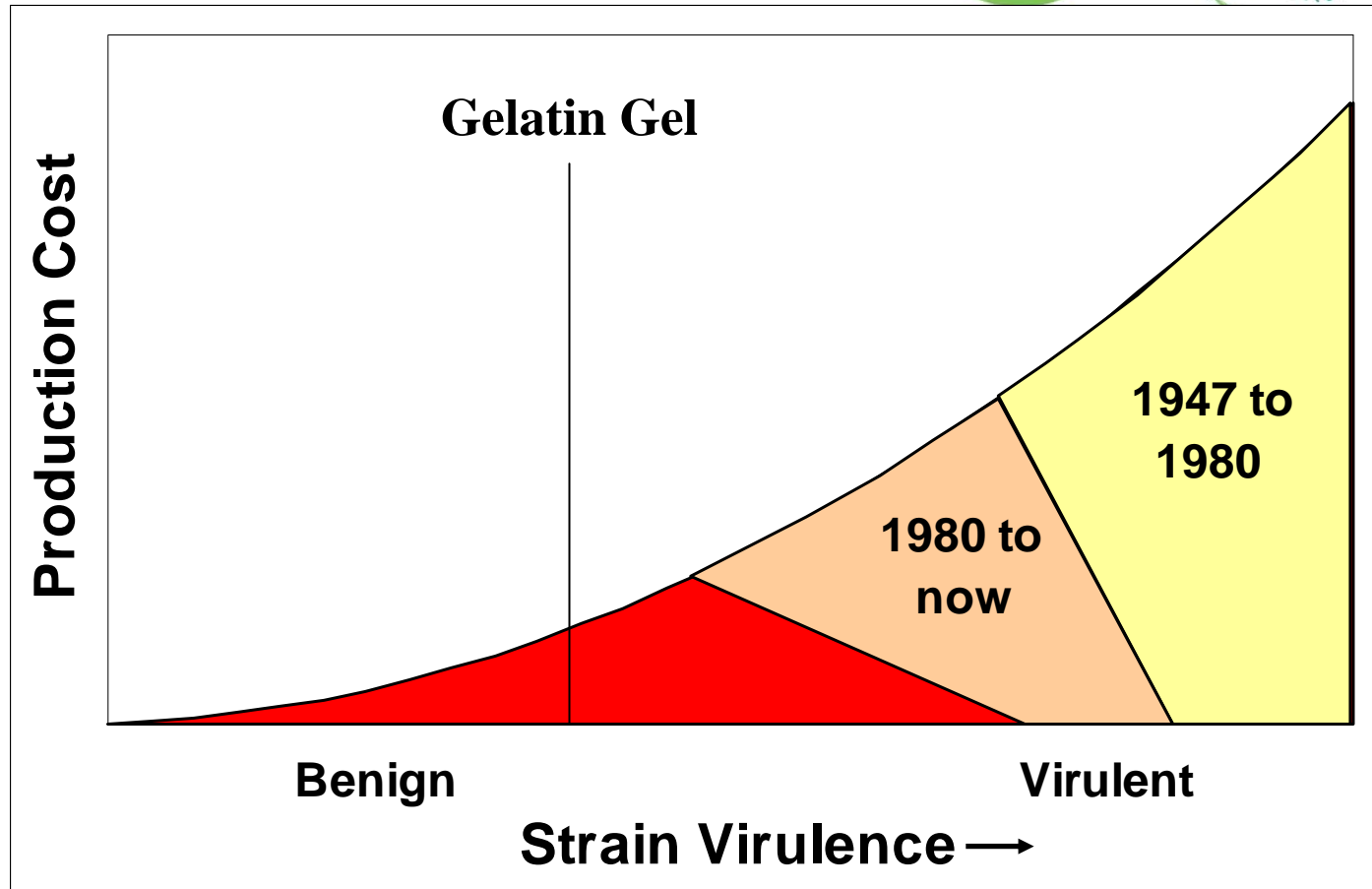
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History of Footrot in WA

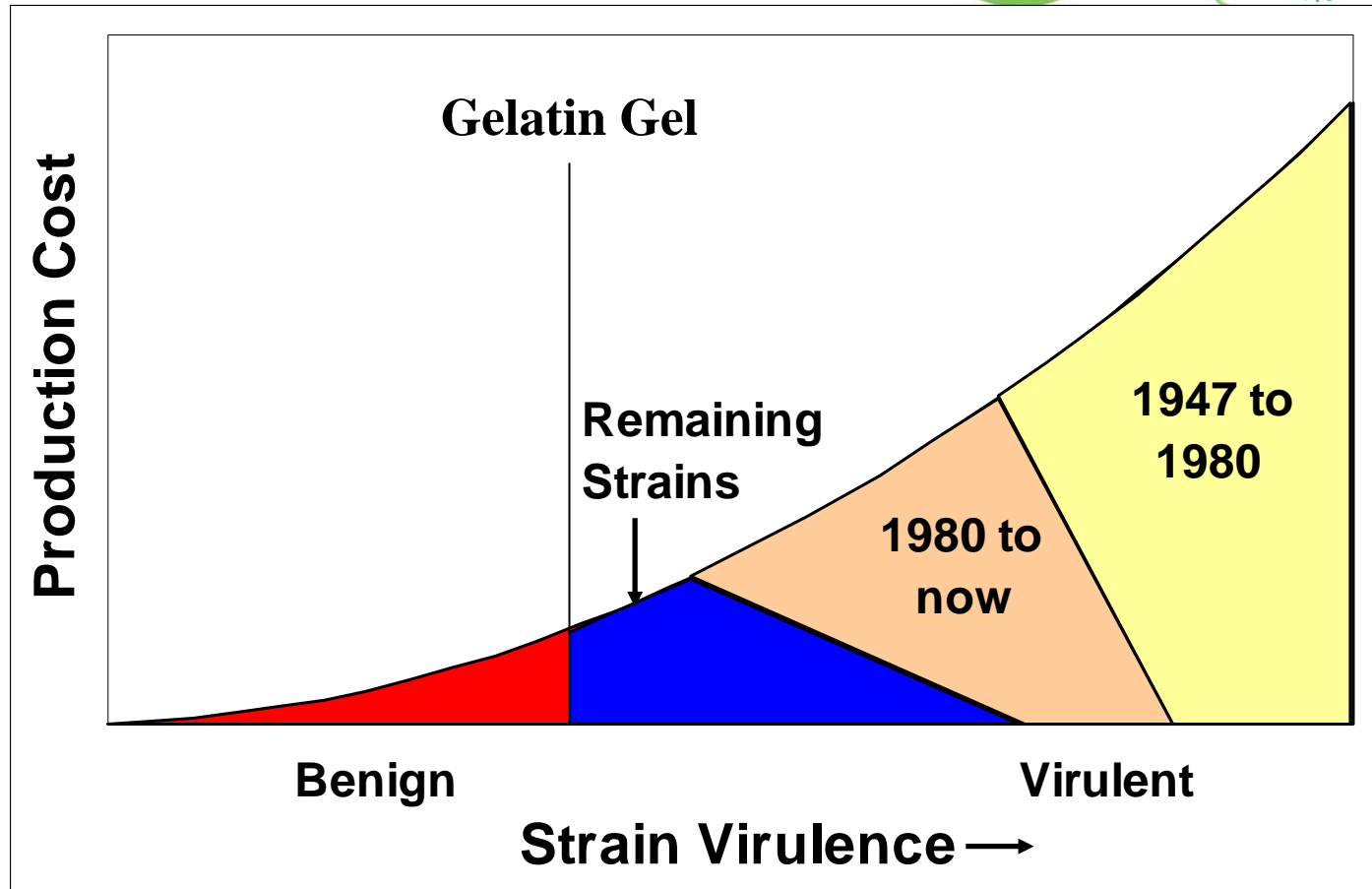
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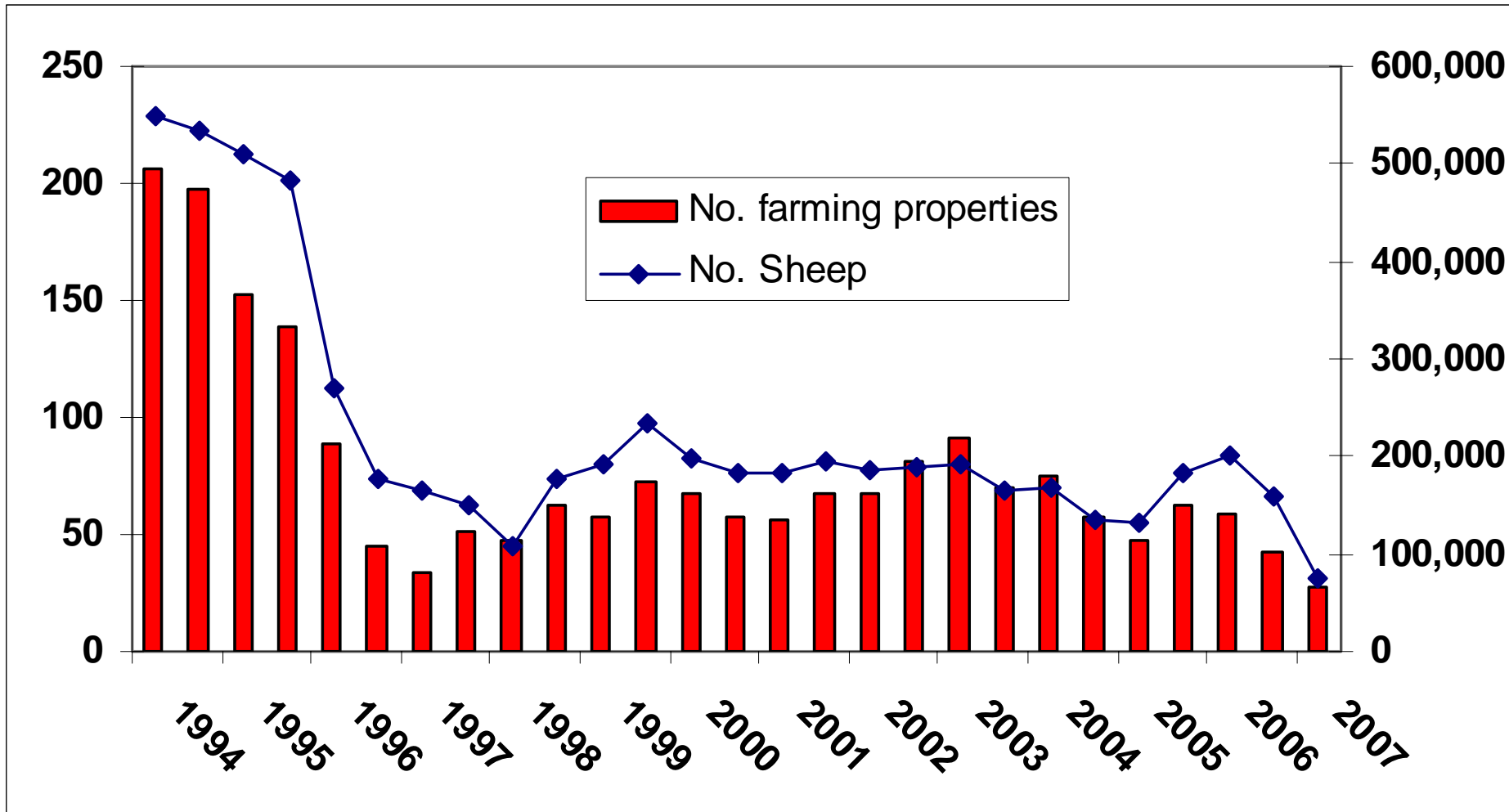
History of Footrot in WA

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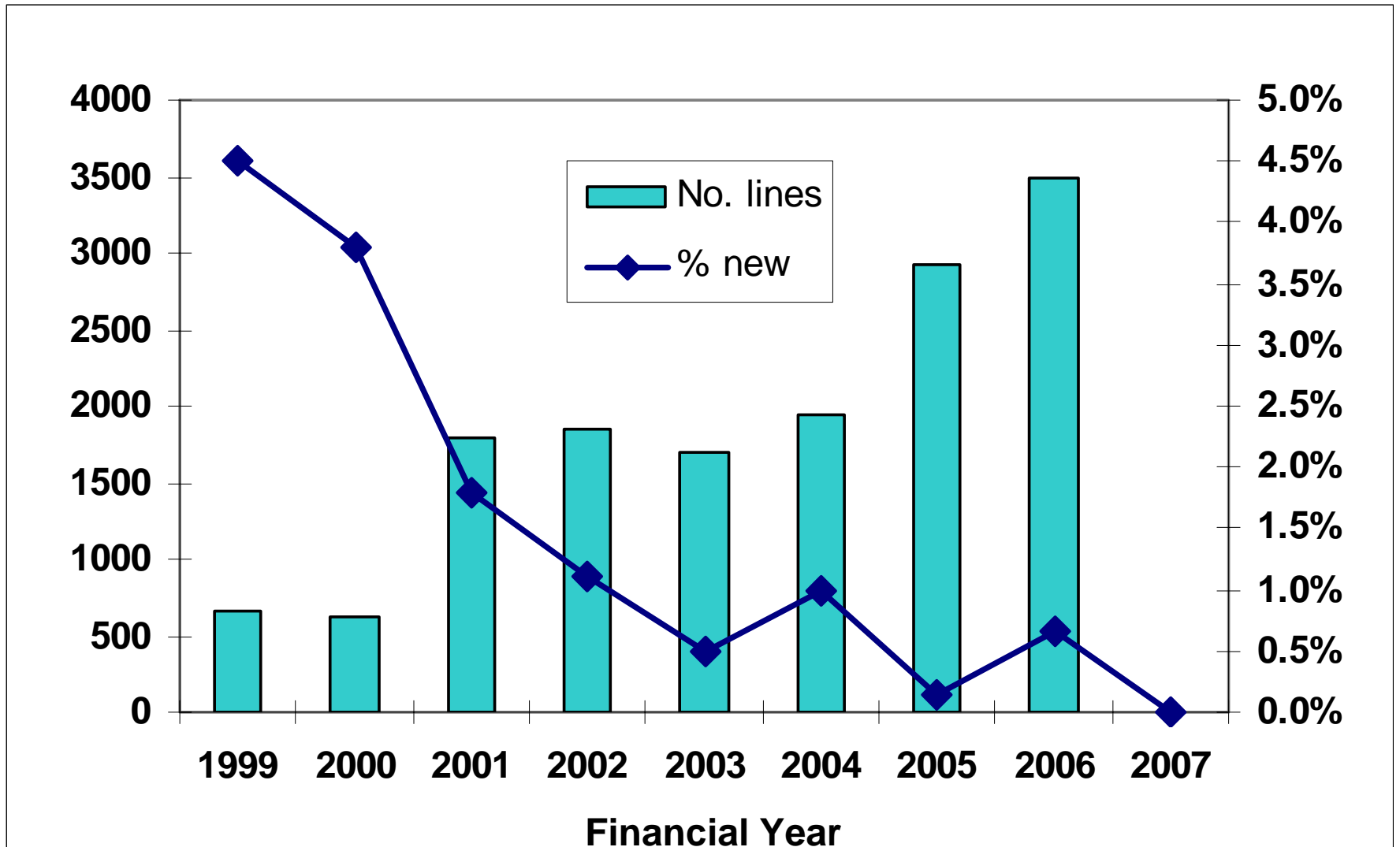


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Situation to 30 June 2007



Virulent Footrot Detection by Abattoir Surveillance



Main limiting factors

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- Detection and diagnosis of VFR on farm – confusion between VFR and BFR
- Prompt removal of infected stock – necessary to reduce spread
- Demonstrating State freedom – prohibitive cost of testing all sheep flocks
- Spread by strays and normal sheep movements – lack of biosecurity controls.

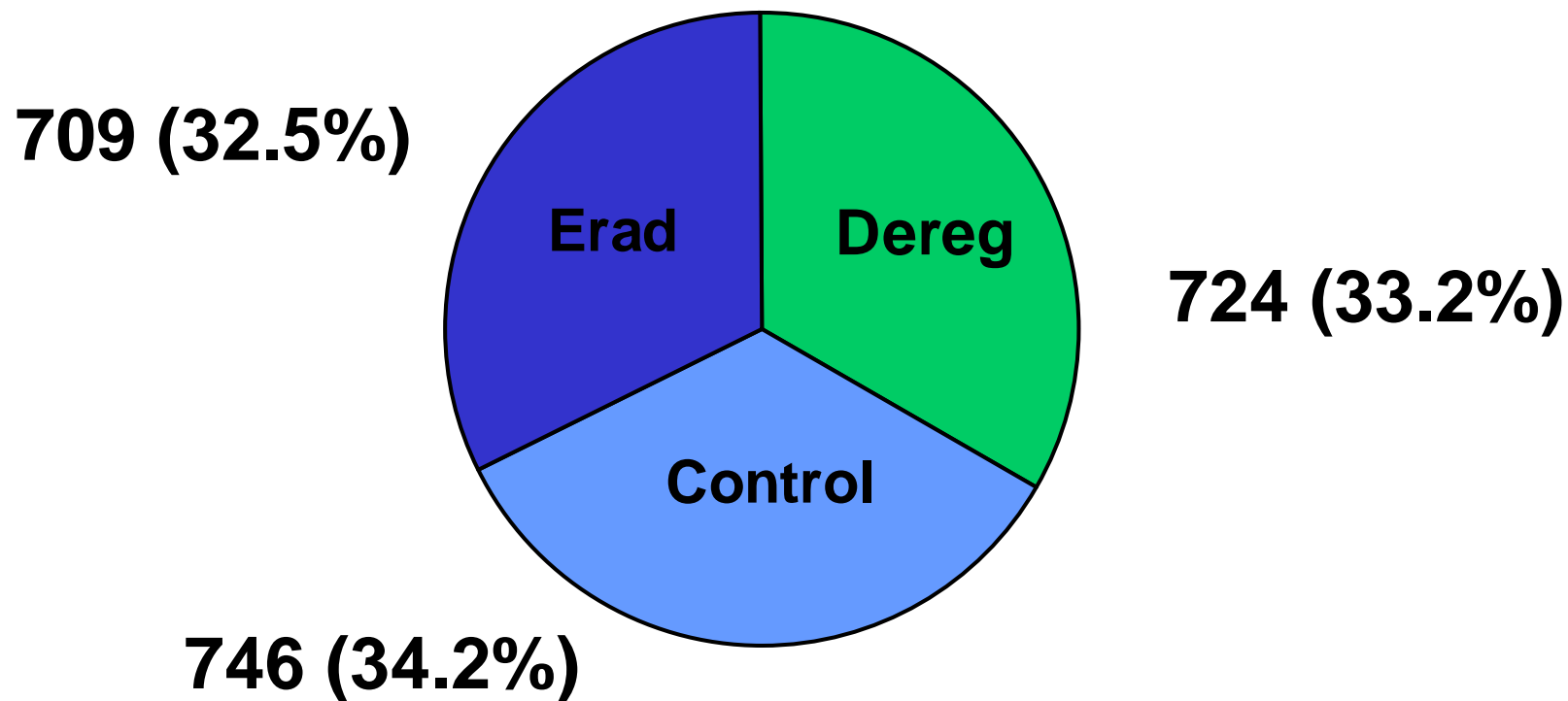
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Survey Results

- 11,000 survey forms sent out
- 2,210 survey forms returned (20%)
- Asked to select either:
 - Eradication
 - Control
 - Deregulation.

Results of sheep producer survey



Future

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- Footrot **control** program
- Majority funded by industry
- Managed by industry.

Re-cap

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Discussed disease eradication from:

- Global human perspective
- National animal perspective
- State animal perspective

Question:

- Is the eradication of animal diseases set to become a curiosity of history?

The future

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Changing circumstances

- Reached the end of an era for endemic disease eradication
- Regional elimination of introduced (exotic) diseases likely to continue to get support
- Emerging diseases, particularly those with zoonotic potential likely to attract increasing attention
- Broader issues such as food safety and animal welfare gaining prominence.

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Conclusion

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The epidemiologists contribution?

- Application of rigorous scientific process in decision making and provision of advice
- Actively pursue broader perspectives on the impact of animal farming and animal disease on sustainable human health.

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