World Organisation for Animal Health

中国兽医药品监察所
China Institute of Veterinary Drug Control
国家动物布鲁氏菌病参考实验室
National Reference Laboratory for Animal Brucellosis

Brucella abortus eradication In New Zealand

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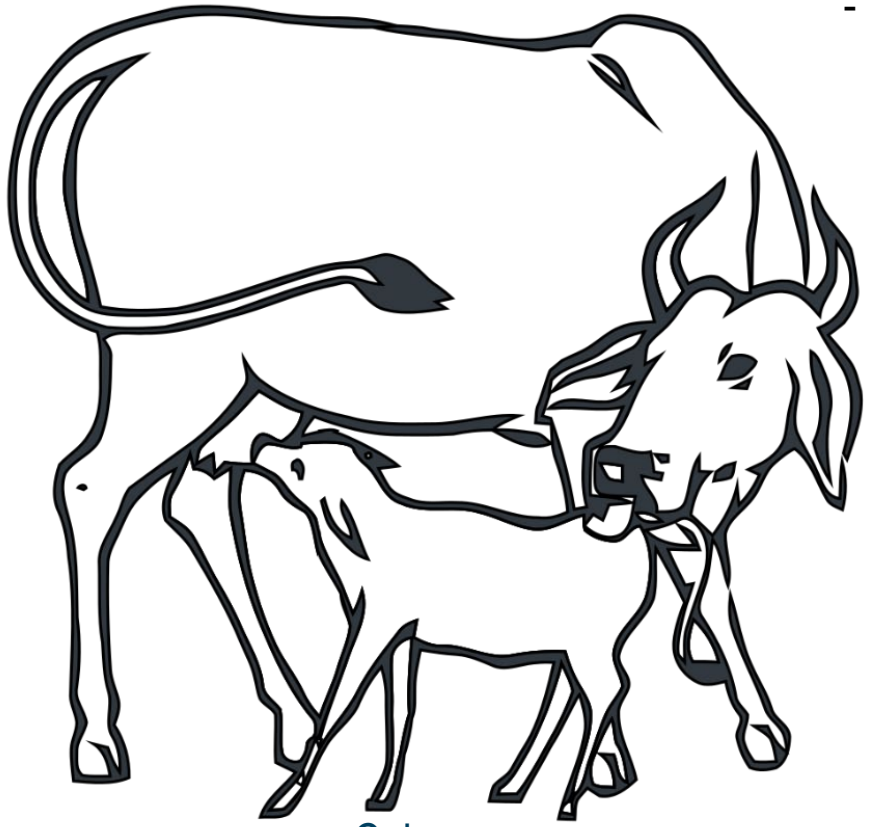
WOAH Regional Training Workshop on Brucellosis Diagnosis
Beijing, China P.R., 5 – 8 August 2025

4th International Academic Conference on Brucellosis
(5 August)

Brucella abortus

90% of infected cows remain infected



Clinical signs

- Highly contagious
- Mid-Late term abortions
- Infertility

Infected through

- Venereal
- Ingestion
  - Milk- calves
  - Contaminated water, feed,
  - Licking (calf, placenta, foetus, genitalia, environment)

Shed +++ bacteria

- At calving
  - Products of calving
  - In milk
- Males in semen

Organism survival

-weeks or months in moist conditions
-Calving camps important
-Lush wet pasture
-Equipment
-Milking machines
-Artificial insemination

Calves

-Calves infected less than 6 months old usually do not remain infected.
-5% born to +ve dam will be infected but sero-negative until calving

New Zealand – Historical situation

1814 -Cattle introduced to New Zealand

1948- Strain 19 vaccine available and used

1966-Slaughterhouse survey- 15% of cattle infected with B abortus
1966-Compulsory Vaccination of all female calves (3-6 months of age) begins

1968- Surveys conducted to assess Brucella tests available for NZ conditions

1969-Voluntary test and eradication scheme begins
1969- Amendment to the existing animals act- test and slaughter for B abortus
all cows which had calved, all bulls over 6 months eligible for testing

1971- Brucellosis compulsory eradication scheme begins in two regions

1972- National Brucellosis compulsory eradication scheme

Reasons for eradication

- Trade
- Public health
- Productivity
- Prior knowledge

Brucellosis compulsory eradication scheme

Government had agreed to finance until 1977

AIM

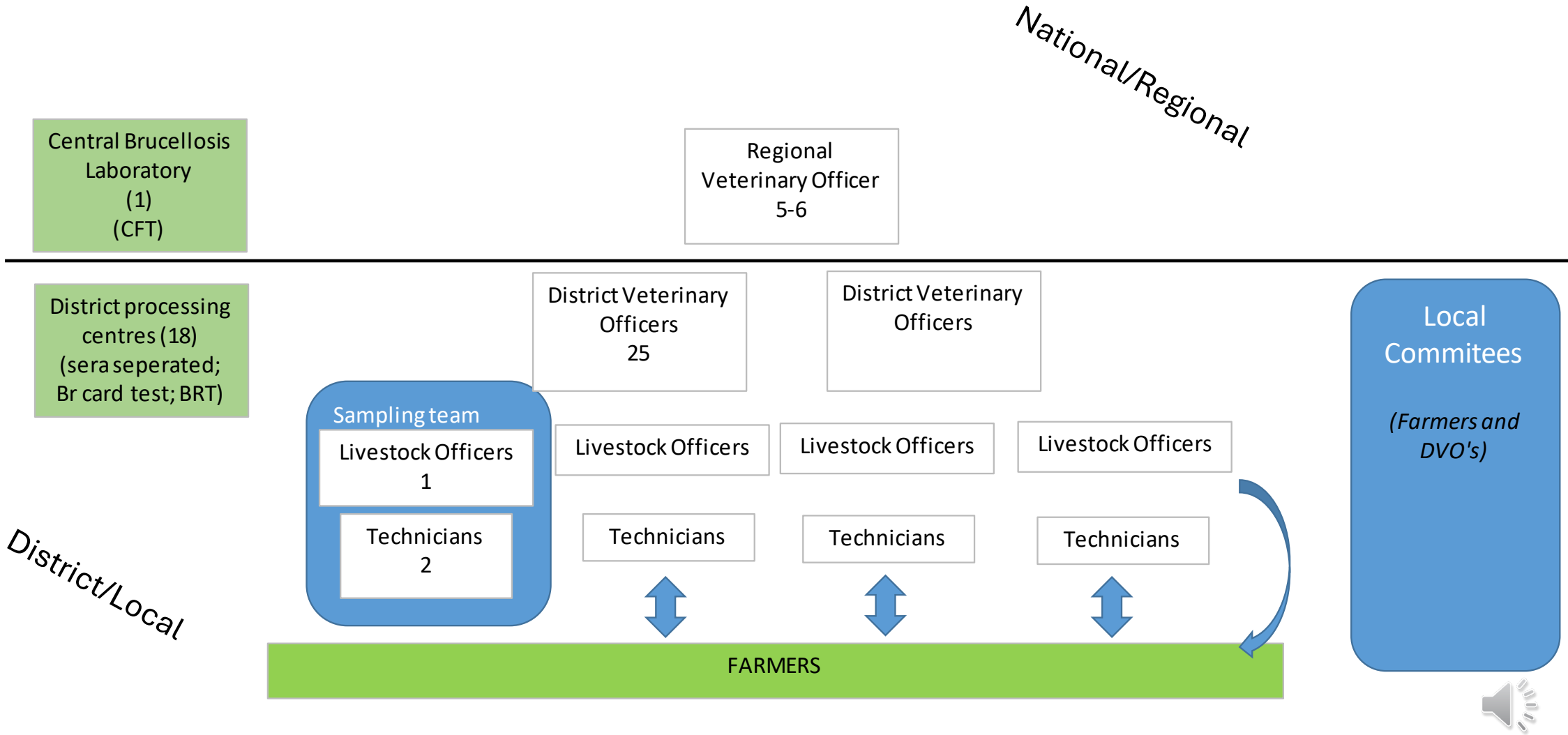
- To bring all cattle in NZ under testing by 1977.
- 80% of all herds expected to be accredited

Field logistics

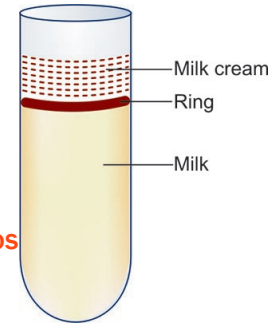
16 Surveillance 1977 No. 2

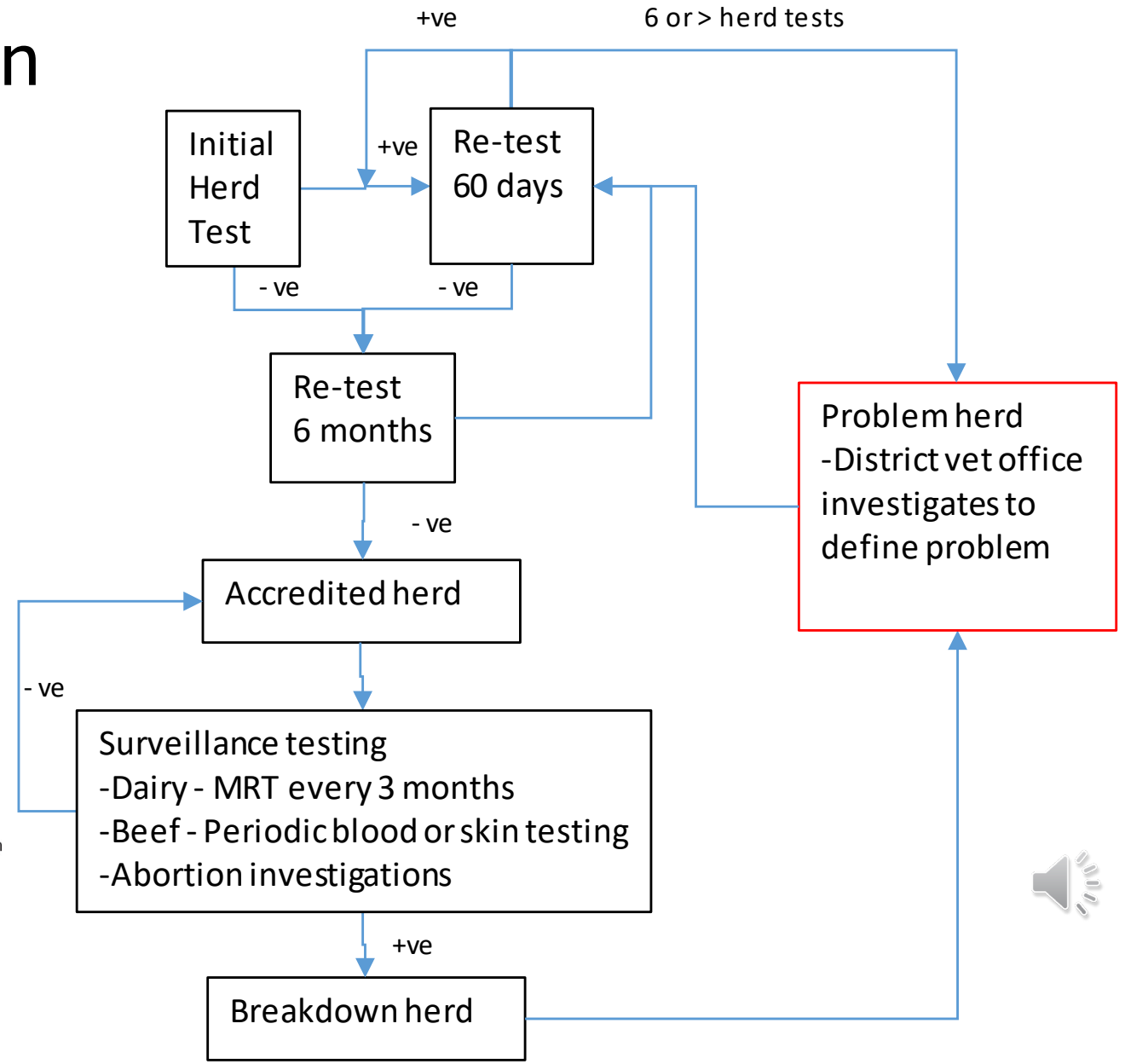
Figure 8 — NUMBER OF ABORTION INVESTIGATIONS IN VETERINARY DISTRICTS (AND PERCENTAGE OF NATONAL TOTAL)

- 25 veterinary districts
  - (with District Veterinary Officer)
- -Each divided into 5 testing zones
  - ~ equal numbers cattle
- -Testing concentrated on 1 zone at a time.
  - -best use manpower/resources
  - -orderly expansion
  - ~ 1 zone per year.


National/Regional
Central Brucellosis Laboratory (1) (CFT)
Regional Veterinary Officer 5-6
District processing centres (18) (sera seperated; Br card test; BRT)
District Veterinary Officers 25
District Veterinary Officers
Local Commitees
(Farmers and DVO's)
Sampling team
Livestock Officers 1
Technicians 2
Livestock Officers
Livestock Officers
Livestock Officers
Technicians
Technicians
Technicians
District/Local
FARMERS

Surveillance / Accreditation





Choice of tests used in New Zealand

- Complement fixation test (CFT)
  - Definitive test (highest Se/Sp)
- Brucellosis card test (BCT)
  - Low cost screening test
- Bulk milk ring test
  - Low cost screening test for dairy farms once accredited
- Abortion Investigations
- The brucellin test - used after 1985

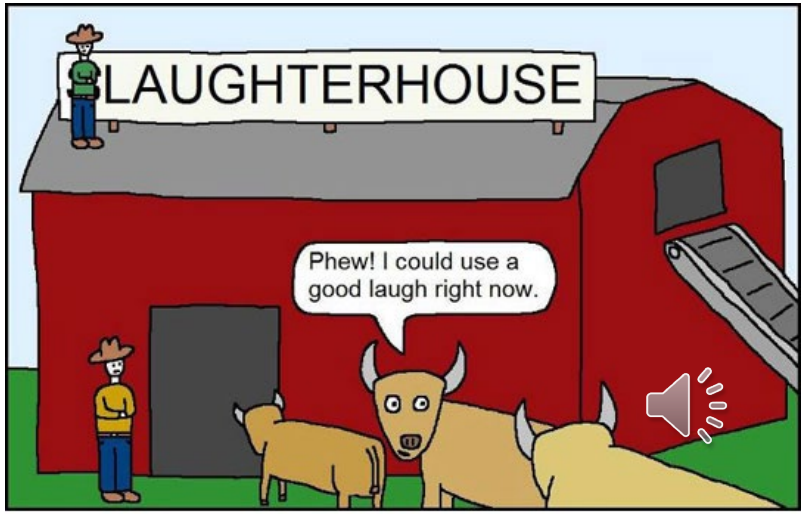
Movement control

- 75% of breakdowns in previously free or accredited herds found to be due to introductions of infected animals.

- 1979- Movement control on herds with *B abortus* infection

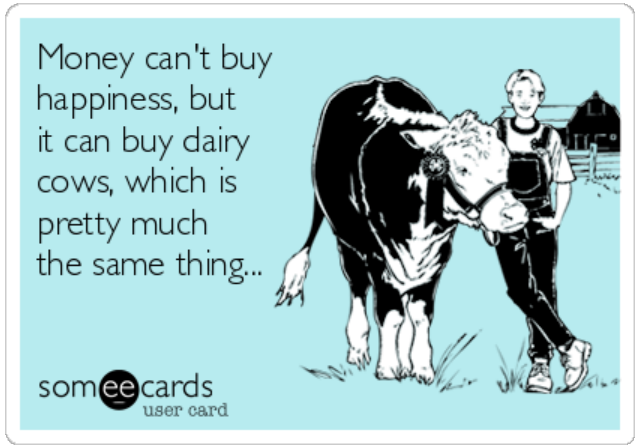
Organism management

- **Identification of positive animals (tag/mark)**
  - Slaughter house within 30 days
  - Infected animals slaughtered
  - Rendered
- **Slaughter entire herd**
  - Negative animals processed
  - Positive animals rendered



Compensation

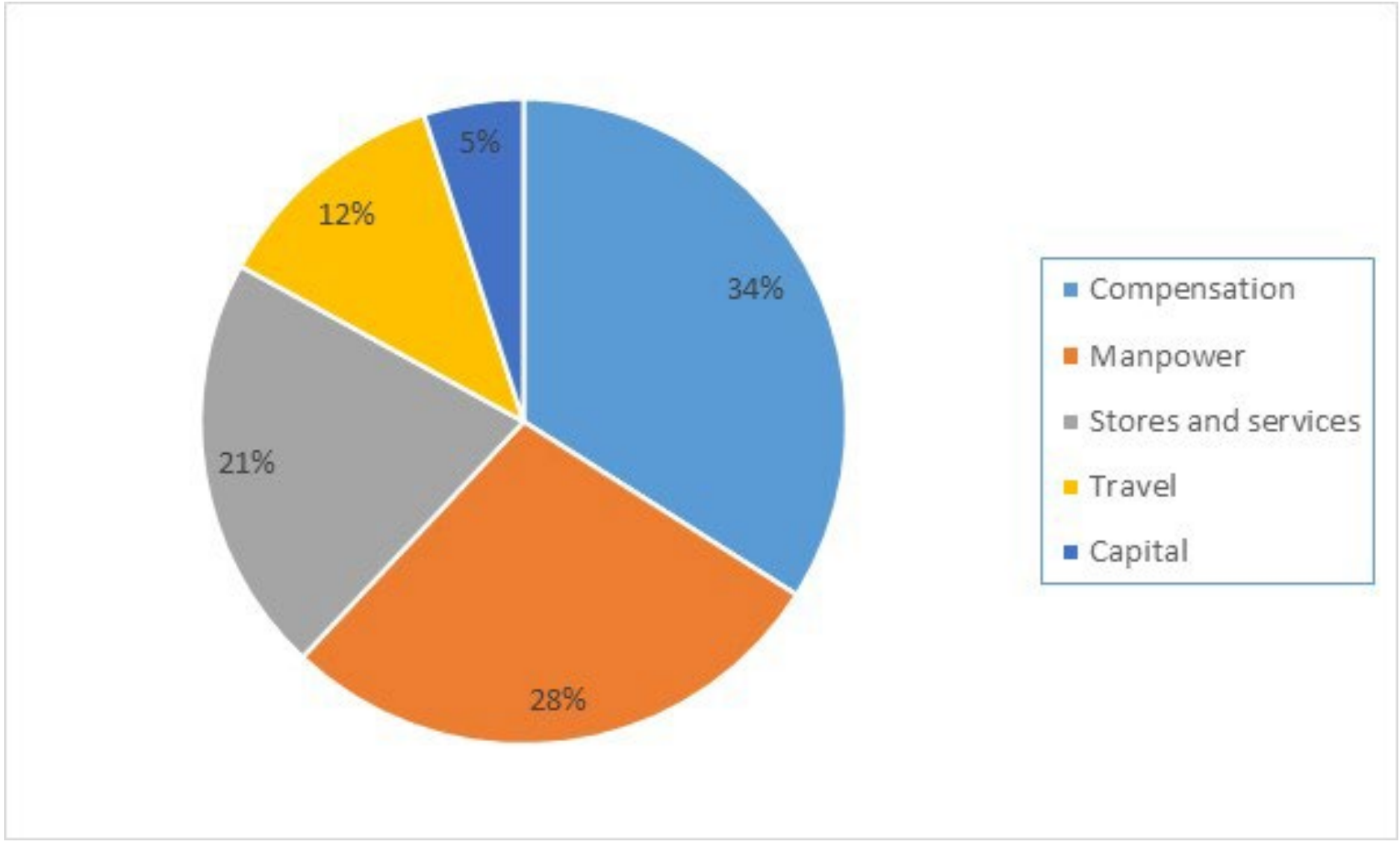
- 1971-1989 funded from tax revenue
- Late 1980's – Shift progressively to a system of levies collected on slaughtered cattle
- Compensation set at 95% of a fair market price



Epidemiology

- **Development of technical strategy**
- **Description of the ongoing situation**
  - Progress, checkpoints, changes
- **Problem solving**
  - How is the disease spreading?
  - Why are farms breaking down?
  - Interpretation of test results
  - Criteria for decision making e.g. movements
  - Modelling (predictive, comparative, descriptive)

Economic breakdown



Timeline continued.

1975 -Strain 19 vaccination of calves no longer compulsory

1977 -All Breeding cattle now under test in New Zealand

1977 -Infected herd ratio From tests conducted 1970-1977 D 50%; B 40%

1979 -Movement control on herds with residual Br abortus infection

1982 -Abortion investigations discontinued (considered no longer cost effective)

1987 -Strain 19 use illegal

1987 -Last isolation of B abortus in NZ

1991 -New Zealand declares freedom

1996 -1996 presented a comprehensive case for biological freedom to the Office International des Epizooties (OIE)

References

- Adlam, G. H. (1978). The eradication of bovine brucellosis in new zealand: History and objectives. *New Zealand Veterinary Journal, 26*(3), 42-43.
- Beckett, F. W., & MacDiarmid, S. C. (1985). The effect of reduced-dose brucella abortus strain 19 vaccination in accredited dairy herds. *British Veterinary Journal, 141*(5), 507-514.
- Davidson, R. M. (1978). Field operations in the brucellosis eradication scheme. *New Zealand Veterinary Journal, 26*(3), 44-45.
- Elliott, R., Moxham, J. W., & Digby, J. G. (1978). The design and operation of the central brucellosis laboratory. *New Zealand Veterinary Journal, 26*(3), 46-52.
- MacDiarmid, S. C. (1988). Future options for brucellosis surveillance in new zealand beef herds. *New Zealand Veterinary Journal, 36*(1), 39-42.
- Nicoletti, P., & Muraschi, T. F. (1966). Bacteriologic evaluation of serologic test procedures for the diagnosis of brucellosis in problem cattle herds.
- Timbs, D. V., Moxham, J. W., & Liberona, H. E. (1978). The use of automated complement fixation techniques in the brucellosis eradication scheme. *New Zealand Veterinary Journal, 26*(3), 52-56.

Thank you!

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