

Bovine trichomoniasis in beef cattle in Wyoming, USA

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Bovine trichomoniasis

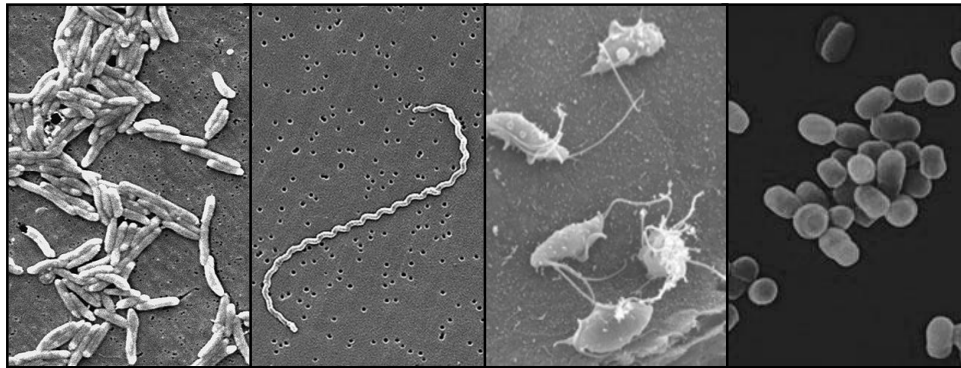
- **Prevalence in bulls**
- **Infection in females with abortion**
- **Risk factors associated with positive herds**

Reproductive diseases of cattle

Disease	Causative agent
Vibriosis	<i>Campylobacter fetus</i>
Leptospirosis	<i>Leptospira pomona</i>
Trichomoniasis	<i>Tritrichomonas foetus</i>
Brucellosis	<i>Brucella abortus</i>

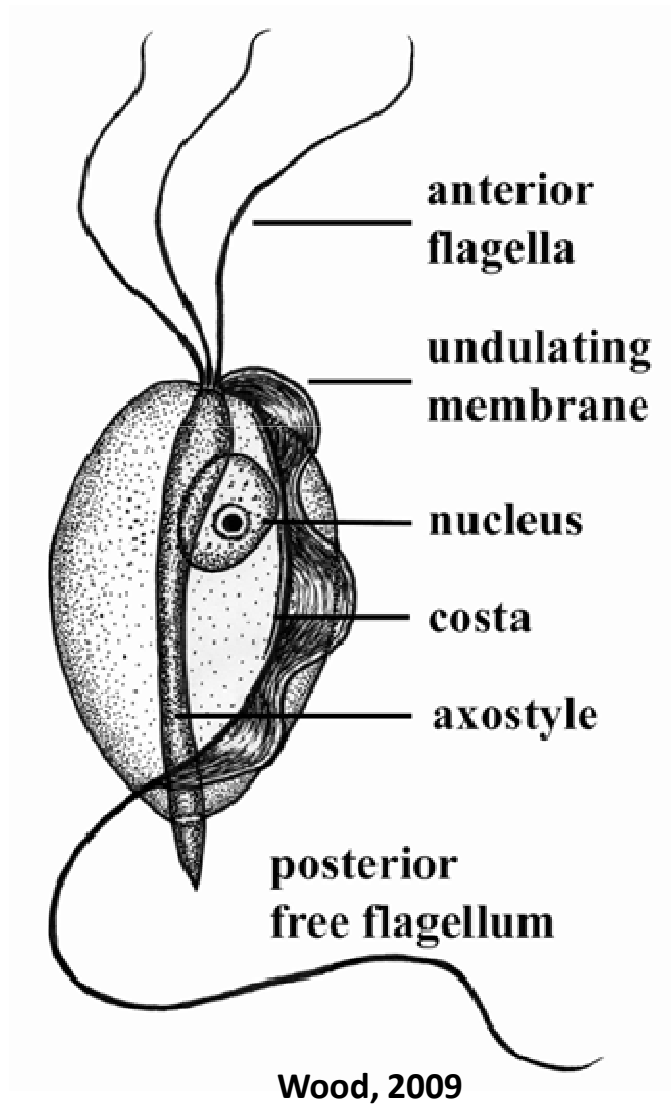


**\$441-502 MILLION
ANNUAL LOSS FOR BEEF
PRODUCERS**

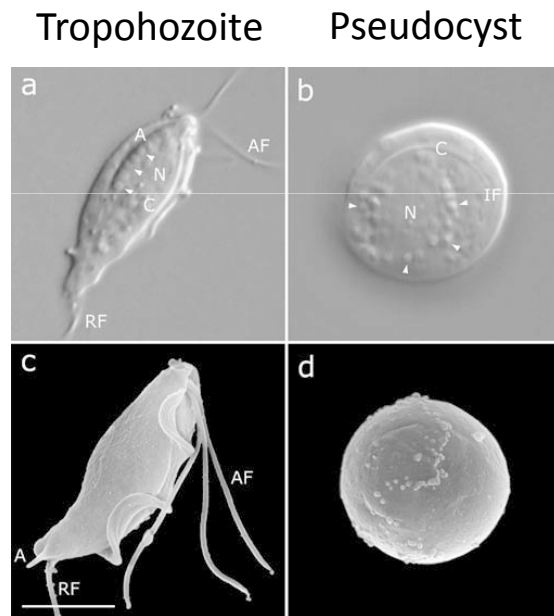


- <http://www.nature.com/news/2008/080206/full/451618b.html>
- http://en.wikipedia.org/wiki/Image:Leptospira_interrogans_strain_RGA_01.png
- <http://dx.doi.org/10.1016/j.vetpar.2012.10.019>
- <http://phil.cdc.gov/phil/home.asp> Public Health Image Library

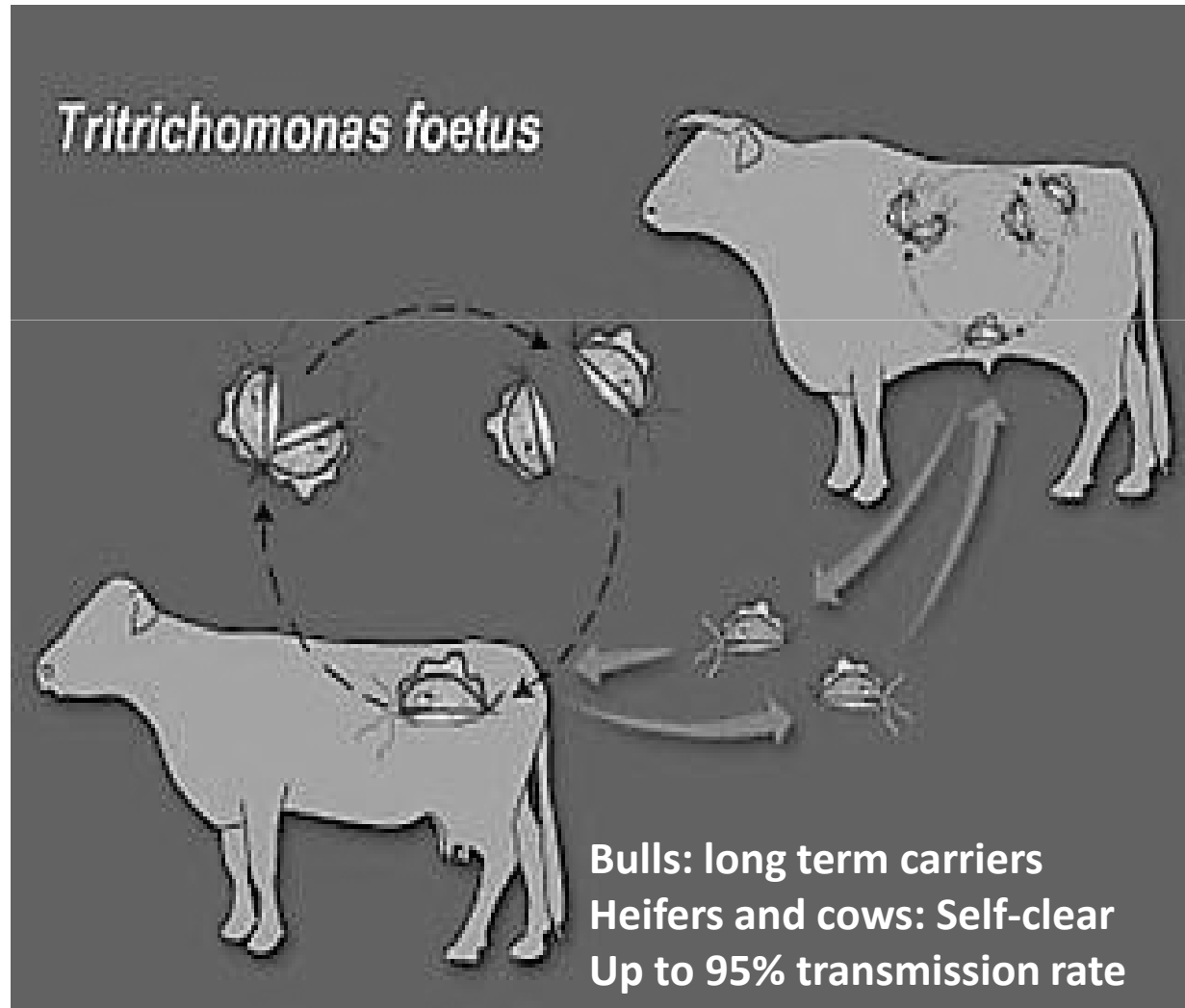
Tritrichomonas foetus



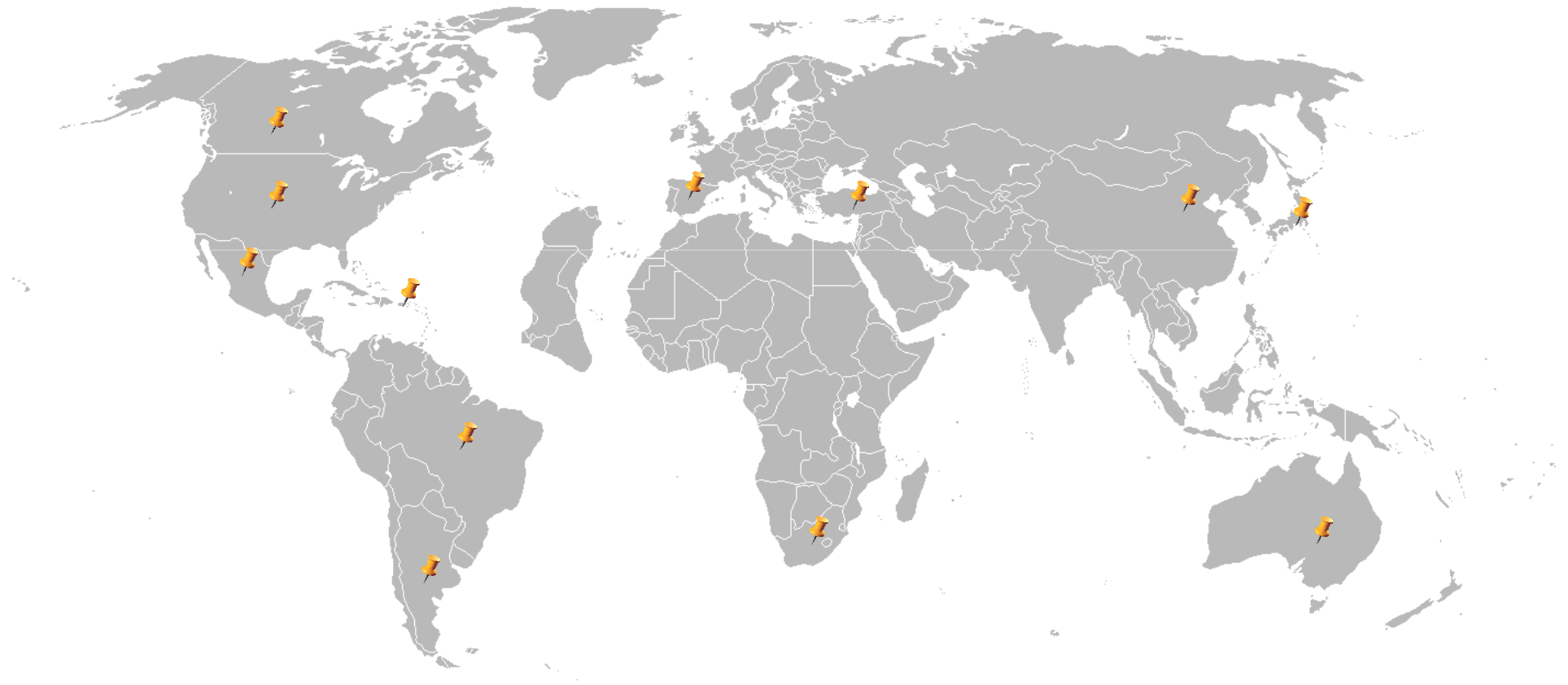
Life cycle and transmission



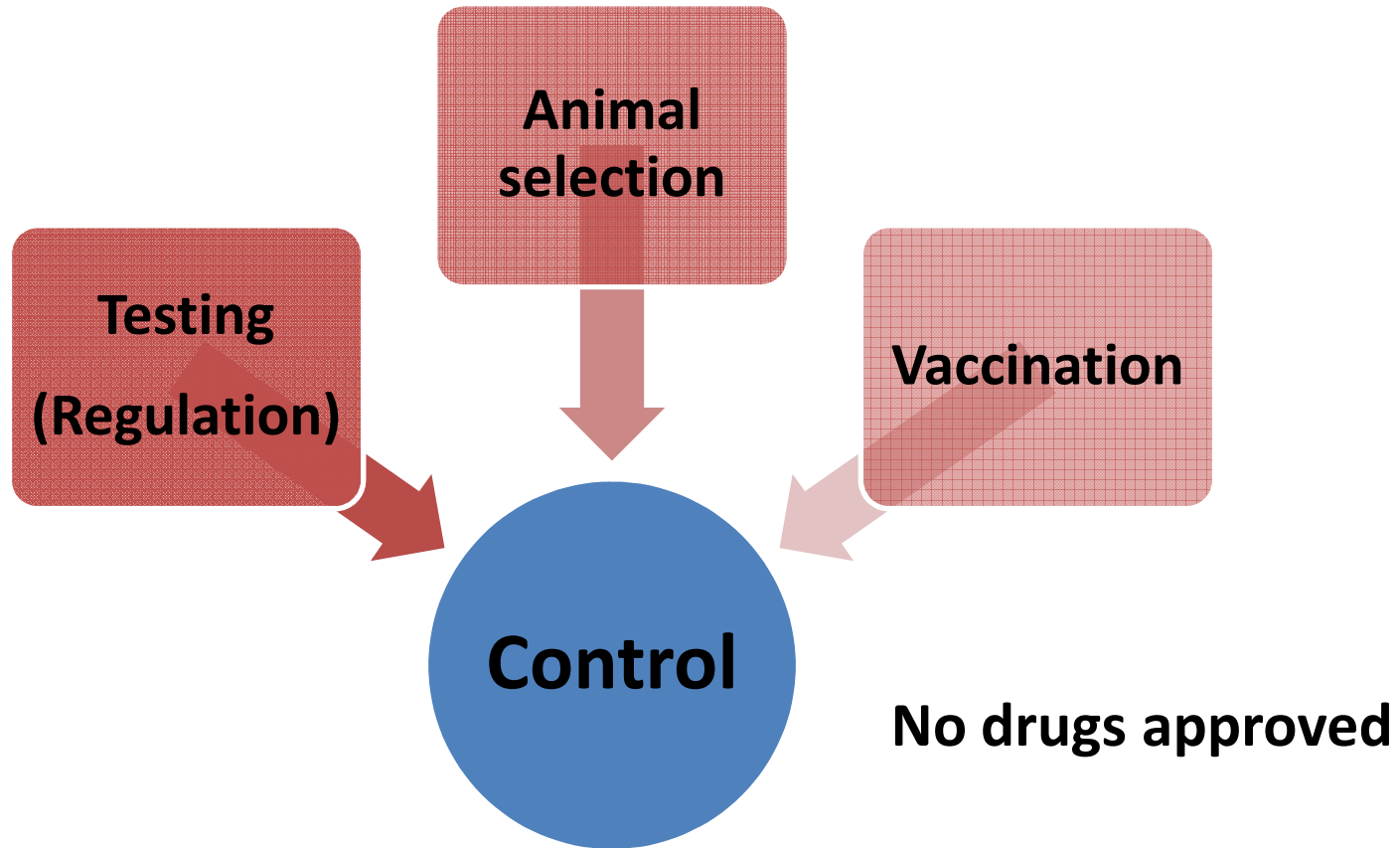
Mariante et al., 2004



World distribution of bovine trichomoniasis

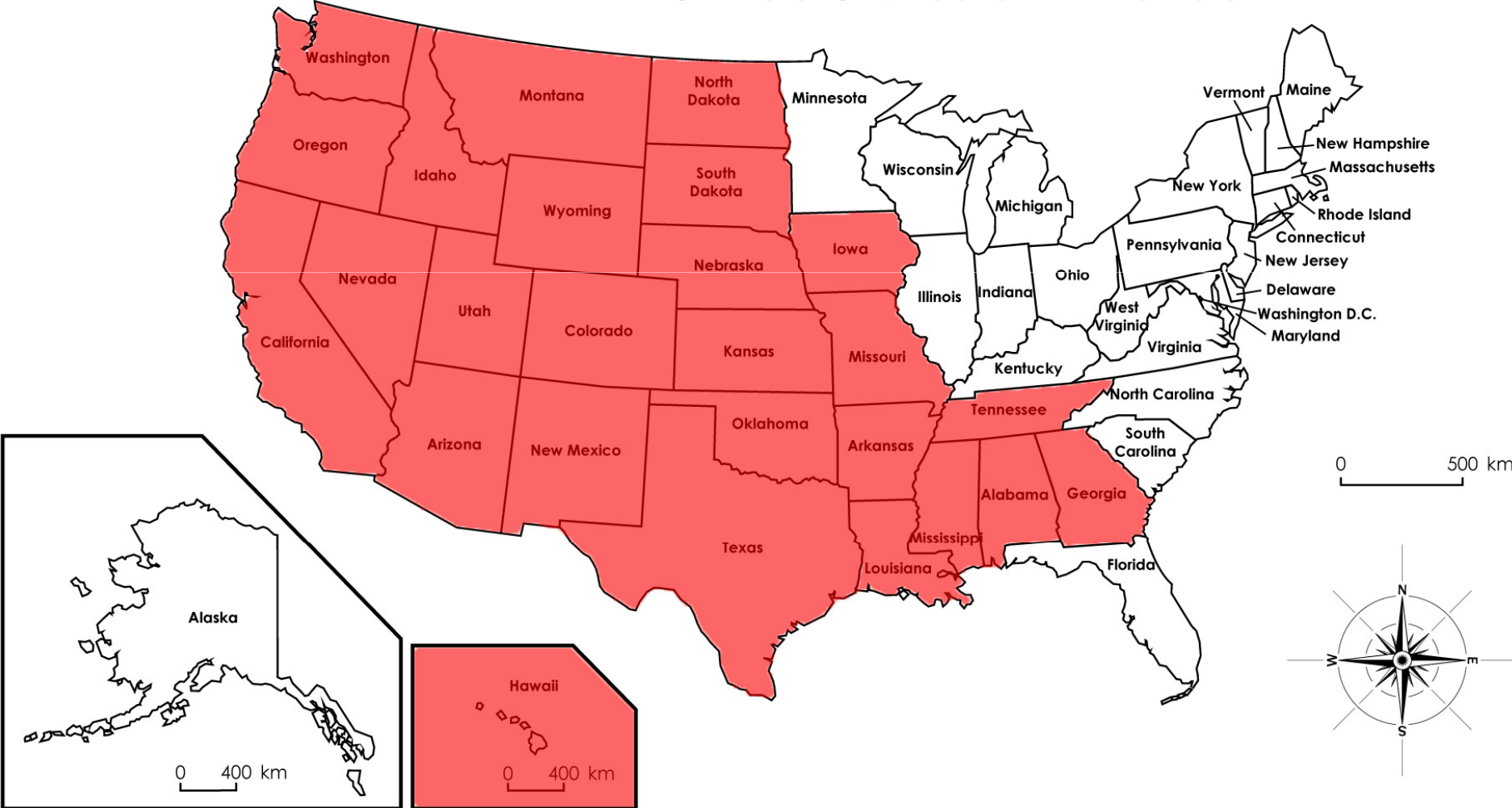


Current control strategies



States with trichomoniasis programs

United States of America



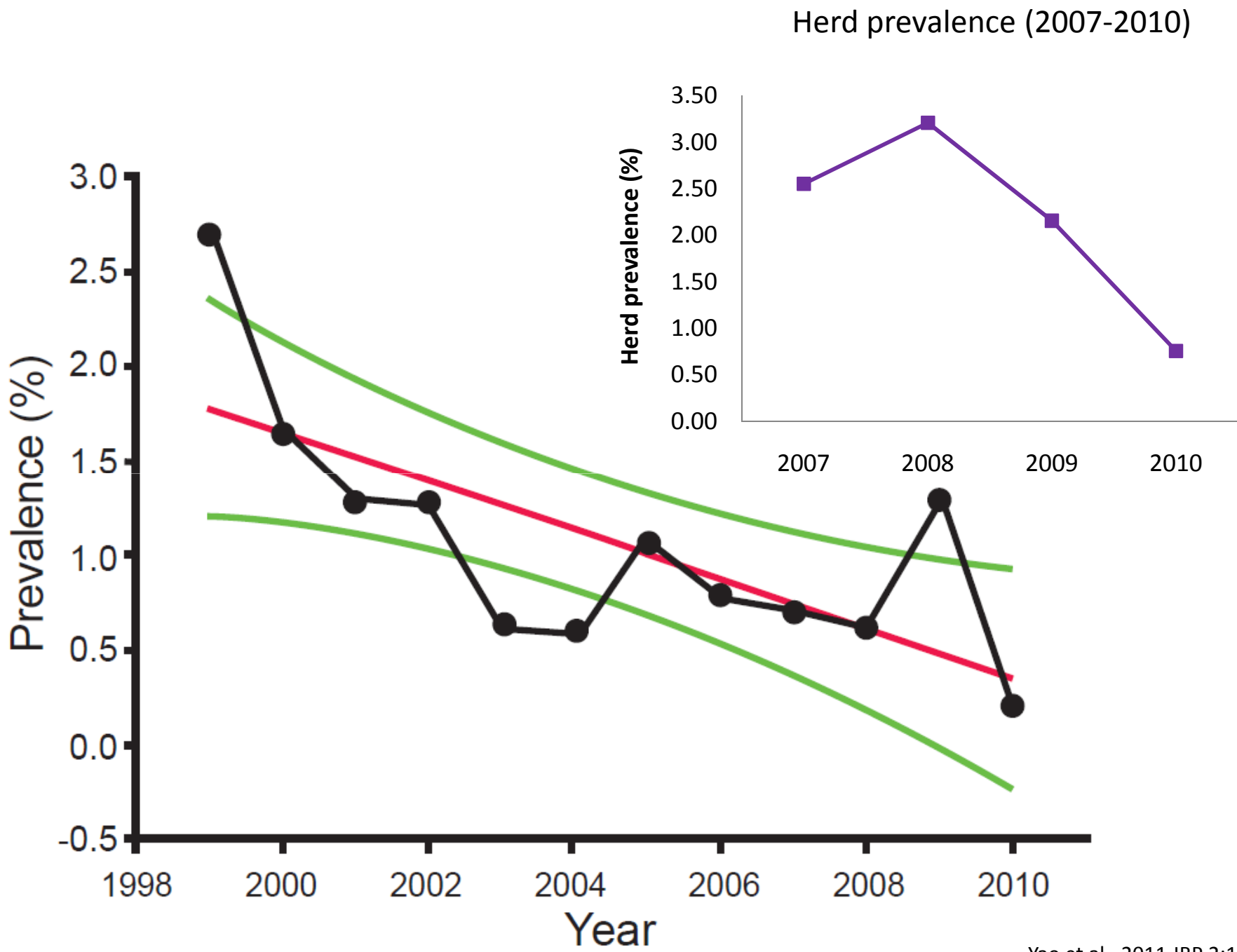
Prevalence in bulls

Data – Wyoming State Veterinary Laboratory (WSVL) and Wyoming Livestock Board between January 1, 1997 and December 31, 2010

Testing for *T. foetus* – culture in Diamond's medium & PCR to amplify a 347bp fragment of 5.8S ribosomal RNA and the internal transcribed spacer region using primer pairs TFR3 and TFR4 (Felleisen RS et al., 1998. J Clin Microbiol 36: 513)

Prevalence in Wyoming beef cattle – bull

Year	Bulls tested	Bulls positive	Prevalence (%)	Predicted prevalence $F(x)=261.020047-0.129685x$
1997	433	5	1.15	
1998	919	18	1.96	
1999	1525	41	2.69	1.78
2000	4604	76	1.65	1.65
2001	6025	78	1.29	1.52
2002	5767	73	1.27	1.39
2003	6855	43	0.63	1.26
2004	7515	44	0.59	1.13
2005	7450	79	1.06	1.00
2006	7270	57	0.78	0.87
2007	7080	50	0.71	0.74
2008	7275	45	0.62	0.61
2009	7597	98	1.29	0.48
2010	8222	17	0.21	0.35



Infection in females with abortion

**Data – Wyoming State Veterinary Laboratory (WSVL)
between January 1, 2000 and December 31, 2010**

Testing for *T. foetus* – culture in Diamond's medium & PCR to amplify a 347bp fragment of 5.8S ribosomal RNA and the internal transcribed spacer region using primer pairs TFR3 and TFR4 (Felleisen RS et al., 1998. J Clin Microbiol 36: 513)

Testing in beef cows/heifers in Wyoming with abortion

Year	Ntot of accessions	Ntot of bull samples	PCR Ntot of cows/heifers (Npos)	Culture Ntot of cows/heifers (Npos)	PCR Ntot of fetus (Npos)	Culture Ntot of fetus (Npos)
2000	193	1530	0	0	0	0
2001	707	6337	0	8 (0)	0	0
2002	693	6750	0	12 (2)	0	0
2003	624	5587	0	14 (7)	0	1 (0)
2004	720	6246	0	9 (0)	0	1 (0)
2005	771	8226	0	9 (0)	0	1 (0)
2006	834	8336	0	2 (0)	0	0
2007	777	7657	4 (0)	7 (0)	2 (0)†	2 (0)
2008	755	8627	1 (0)	2 (0)	3 (0)	1 (1)#
2009	802	8454	4 (0)*	2 (0)	2 (0)	2 (0)‡
2010	943	10059	17 (0) ¥	14 (0)	3 (0)	4 (0)
Total	7819	77809	26 (0)	79 (9)	10 (0)	12 (1)

Testing results for *T. foetus* among samples collected in Wyoming from the genital tract of cows/heifers with abortion and aborted fetuses

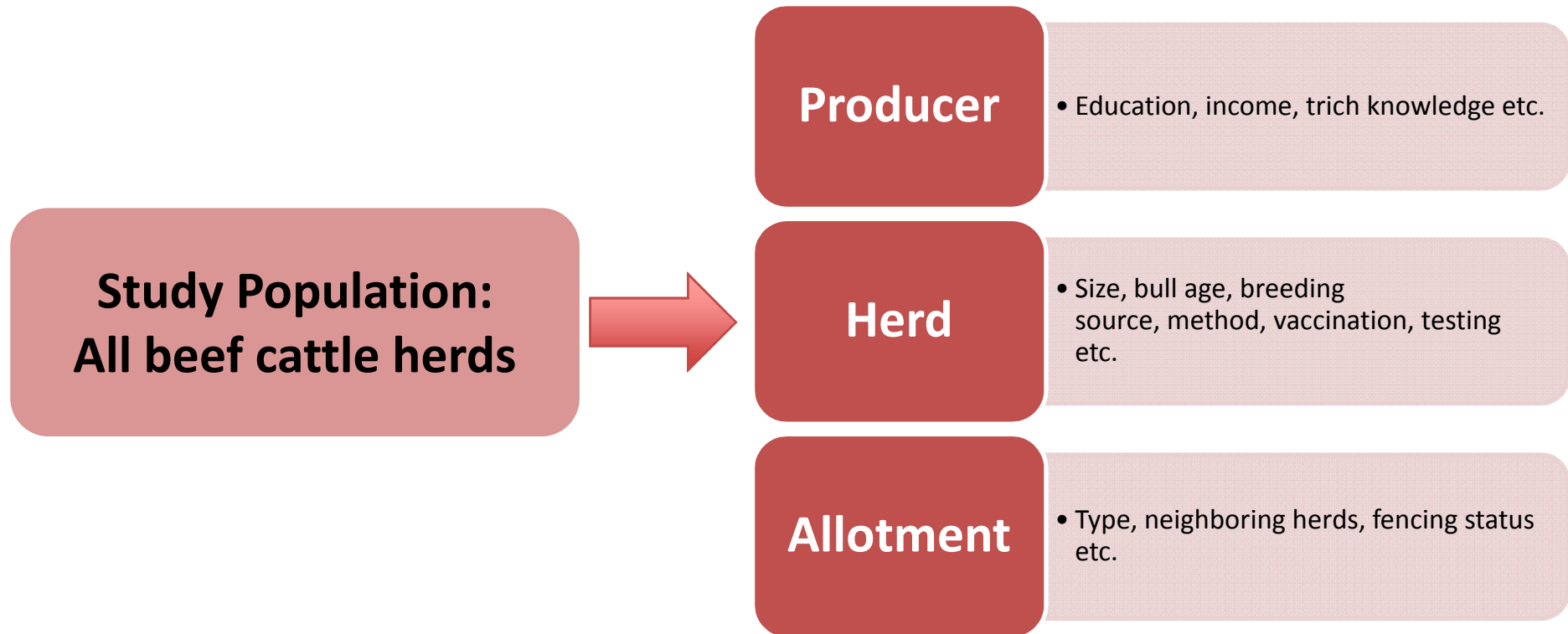
Sample	Npos	Ntot	%pos
Aborted fetus	1	22	4.5
Placenta ⁺	1	4	25.0
Cows/heifers			
Uterus	8	53	15.1
Vagina	1	11	9.1
Cervix	0	29	0.0
total	9	93	9.7

Risk factors associated with positive herds

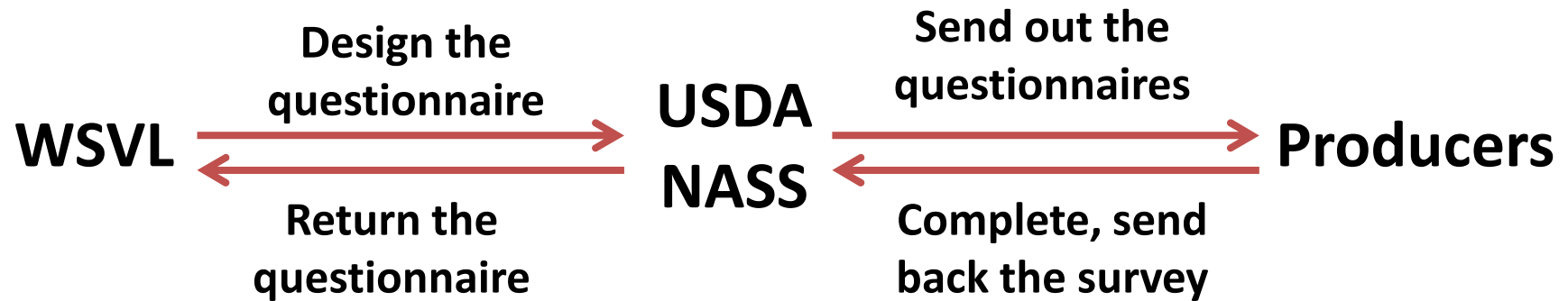
- **Aim**

To identify risk factors associated with herds infected with *T. foetus* in Wyoming beef cattle.

Study design



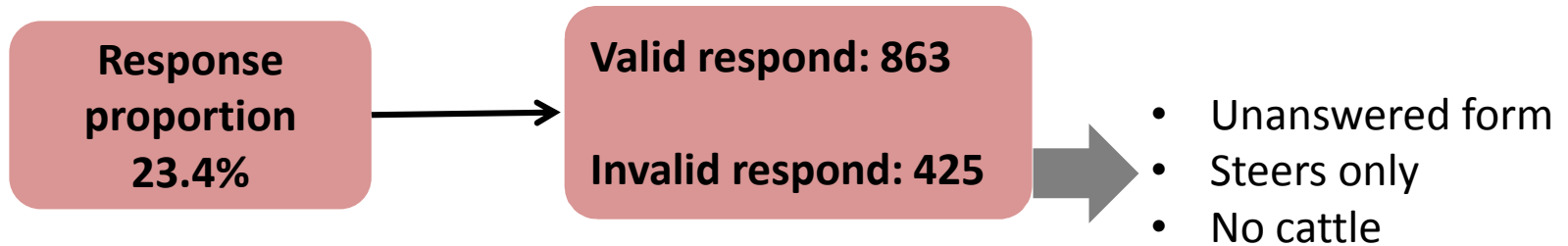
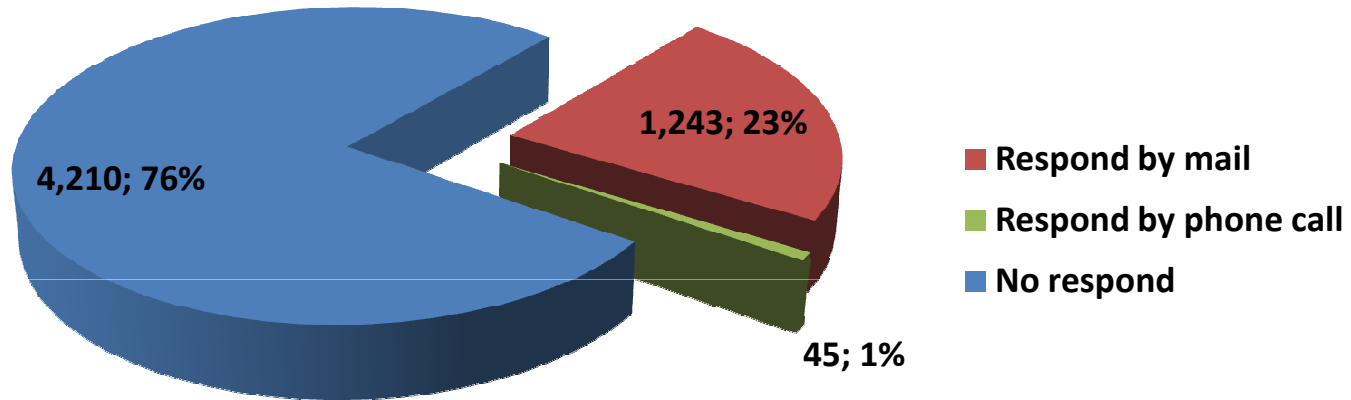
Survey conduction



Confidential

Proportion of respondents

Total: 5,498



Analytical methods

Software

- Microsoft office Excel
- IBM SPSS19
- SISA (online tool)

Quality control

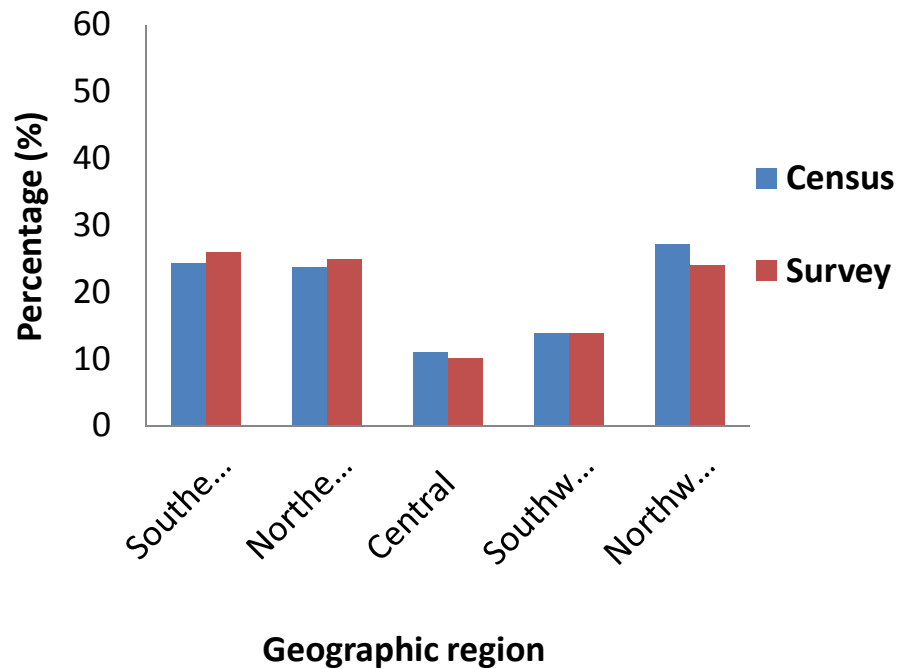
- Data confirmation
- Refinement
- Exclusion of unqualified data

Statistical method

- Frequency analysis
- Pearson's chi-square
- Fisher's exact test

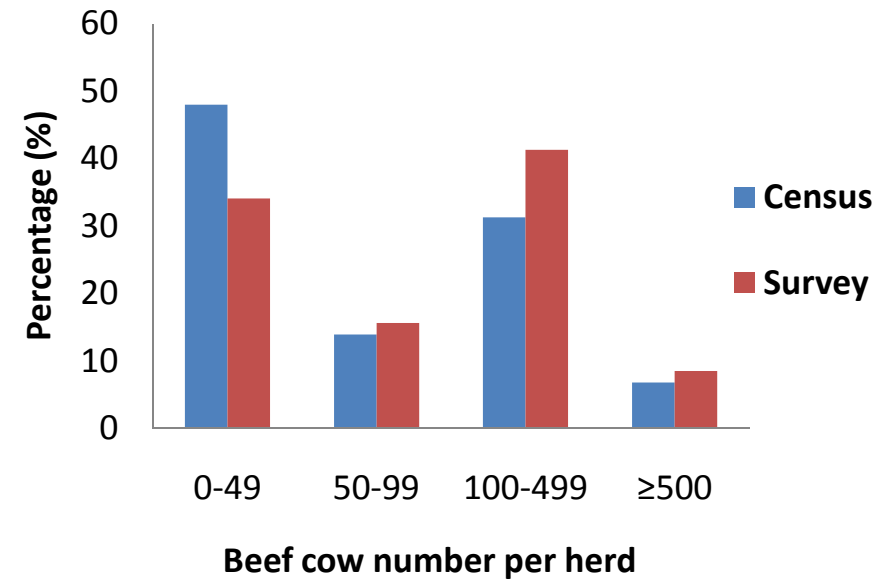
Feedback

Feedback by geographic regions



($\chi^2=0.769, p>0.94$)

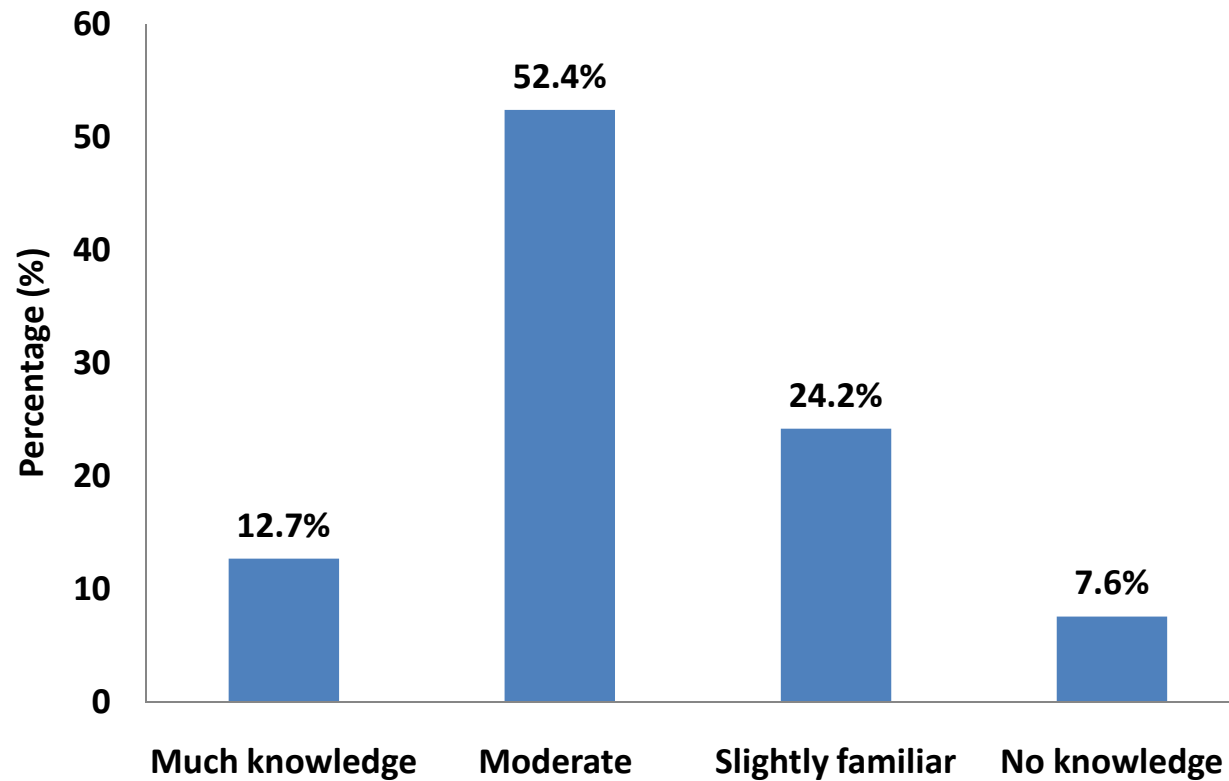
Feedback by herd size



($\chi^2=7.860, p<0.05$)

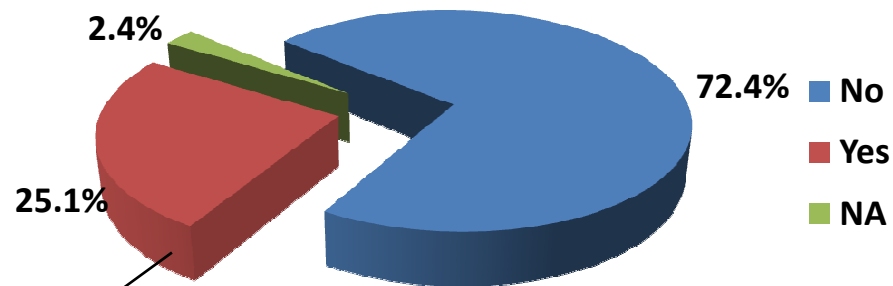
Represents bigger sized herds (cow number ≥ 50)

Producer's awareness of bovine trichomoniasis

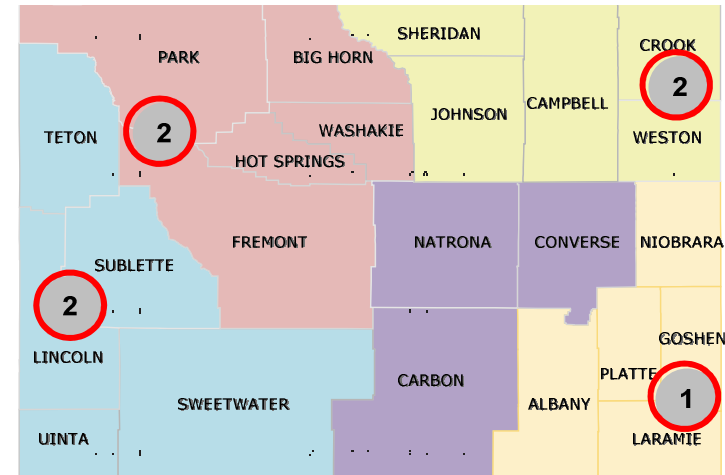


Trichomoniasis testing

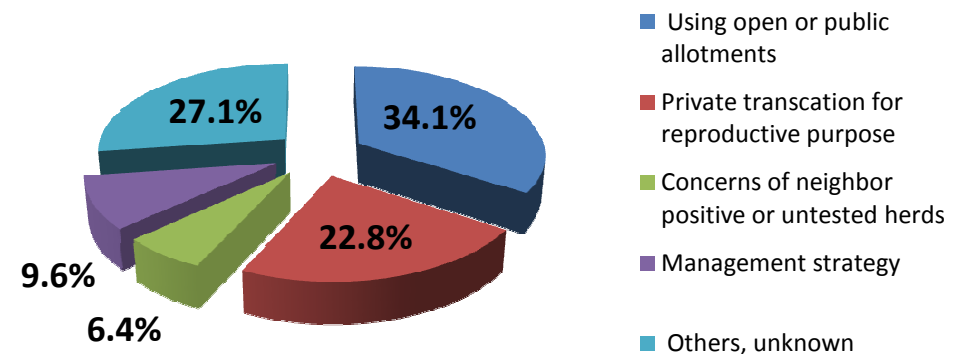
Trichomoniasis test



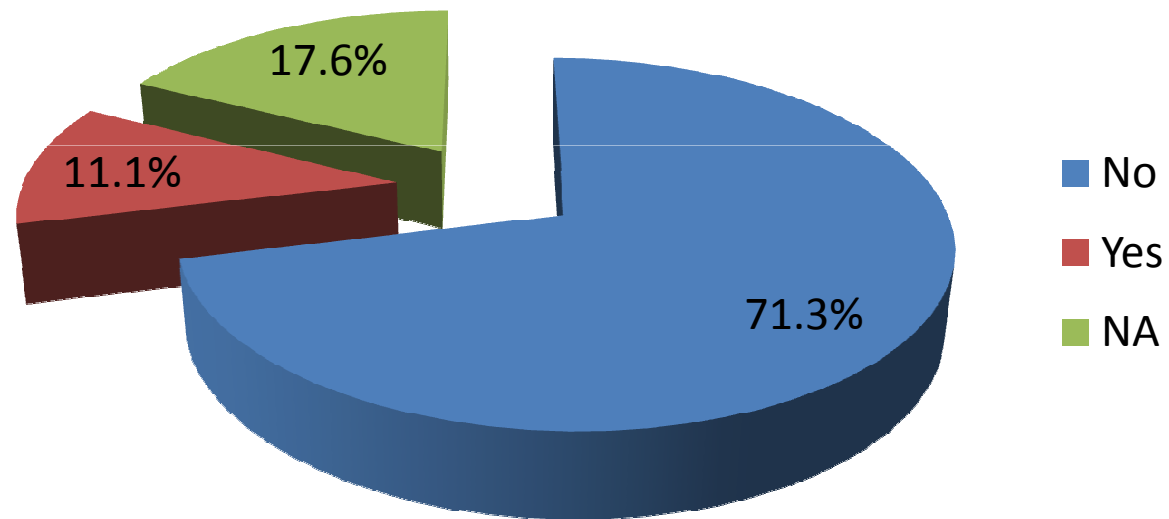
304 negative,
8 positive



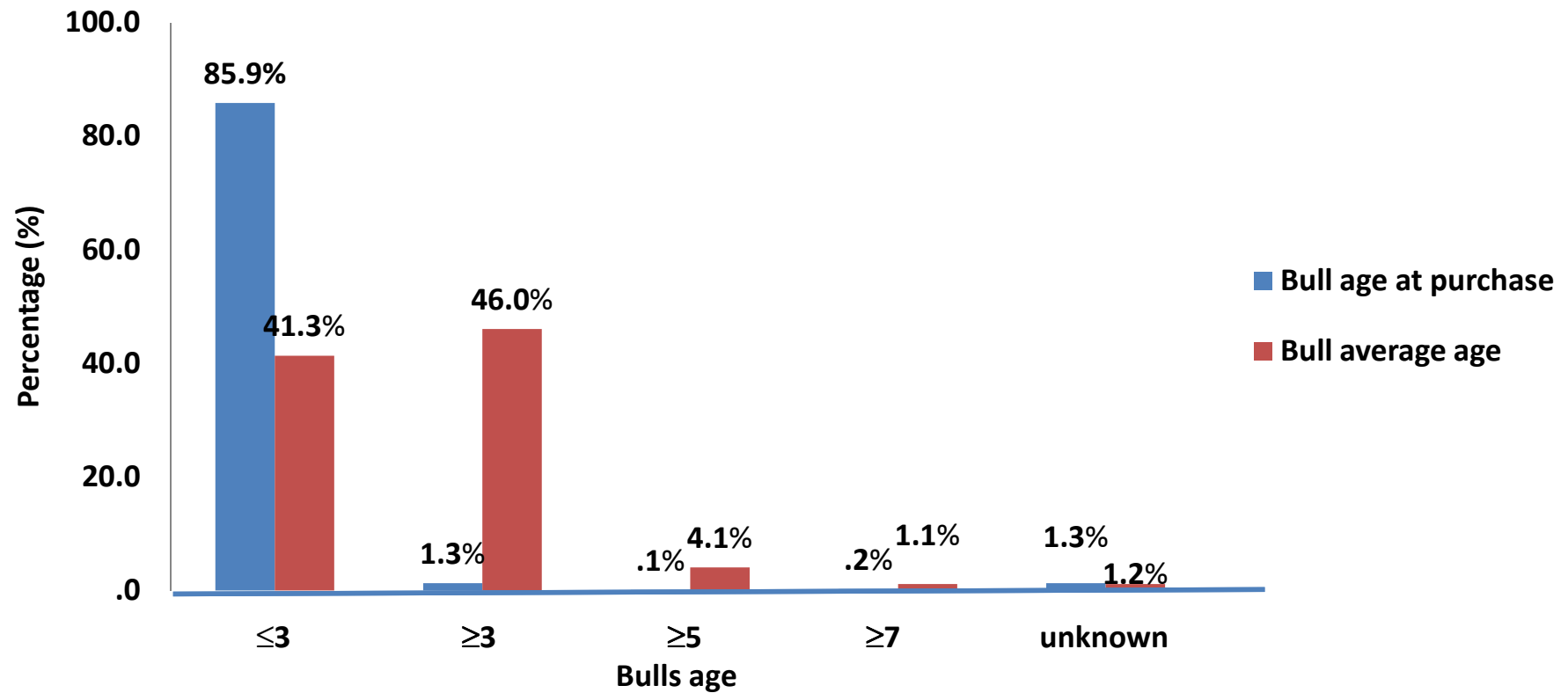
Reasons for trichomoniasis testing



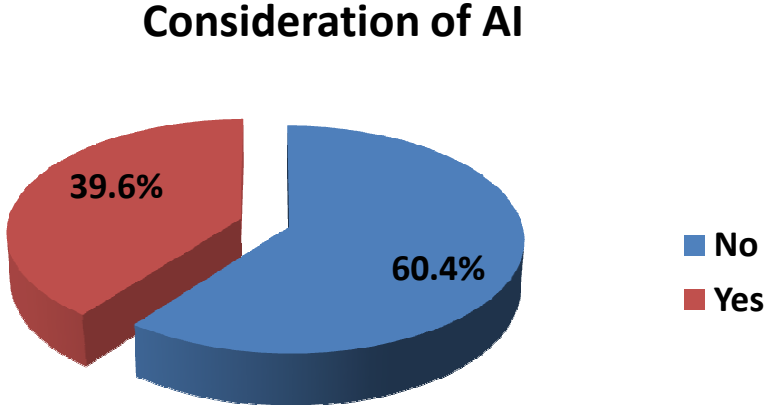
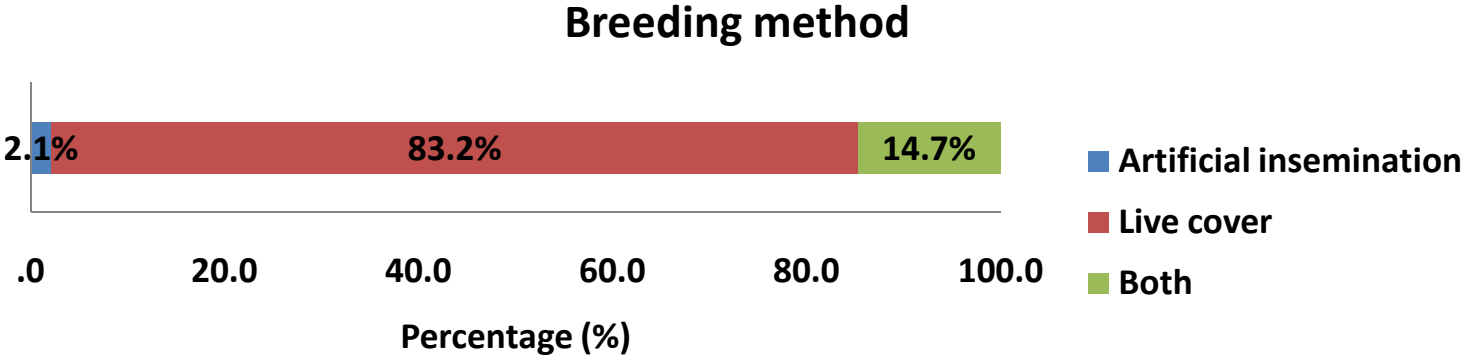
T. foetus Vaccination



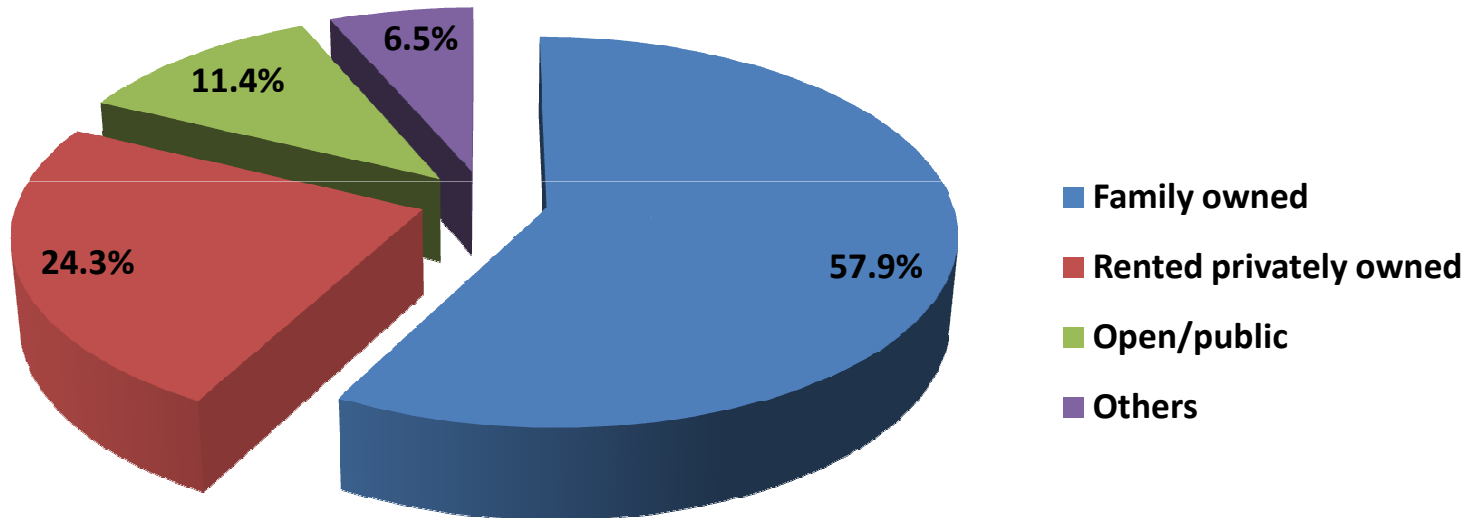
Average bull age



Breeding source

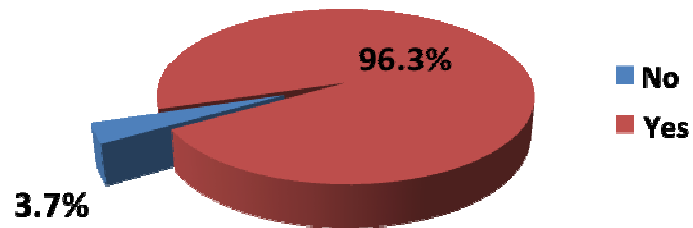


Allotment type

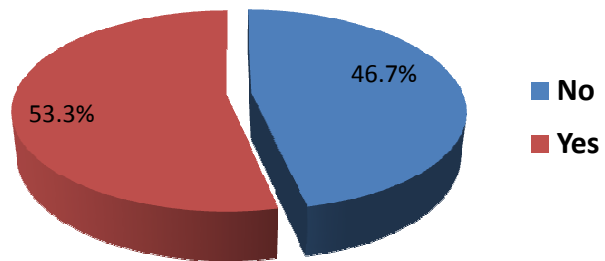


Fencing

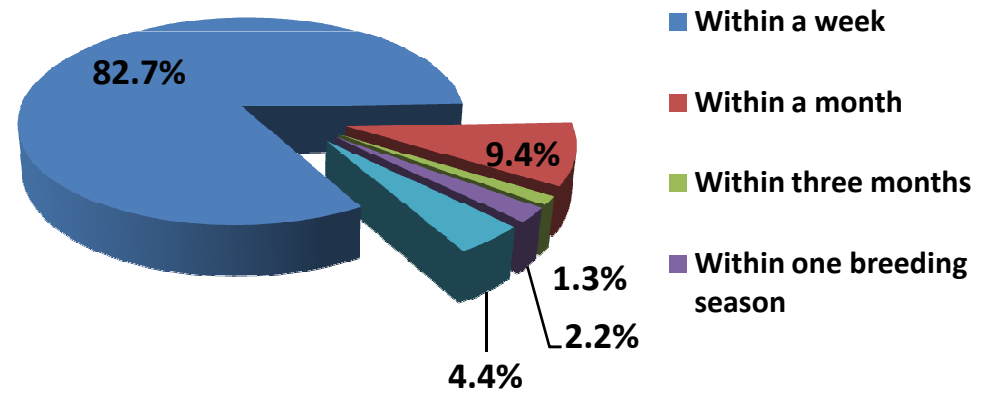
Allotment fencing



Broken fences



Time for get broken fences fixed



Risk factors associated with bovine trichomoniasis

Neighboring a positive herd(s)

- $p=0.0003$
- OR=18.3 (4.1-81.1)

Using public allotment

- $p=0.003$
- OR=2.9 (0.7-12.1)

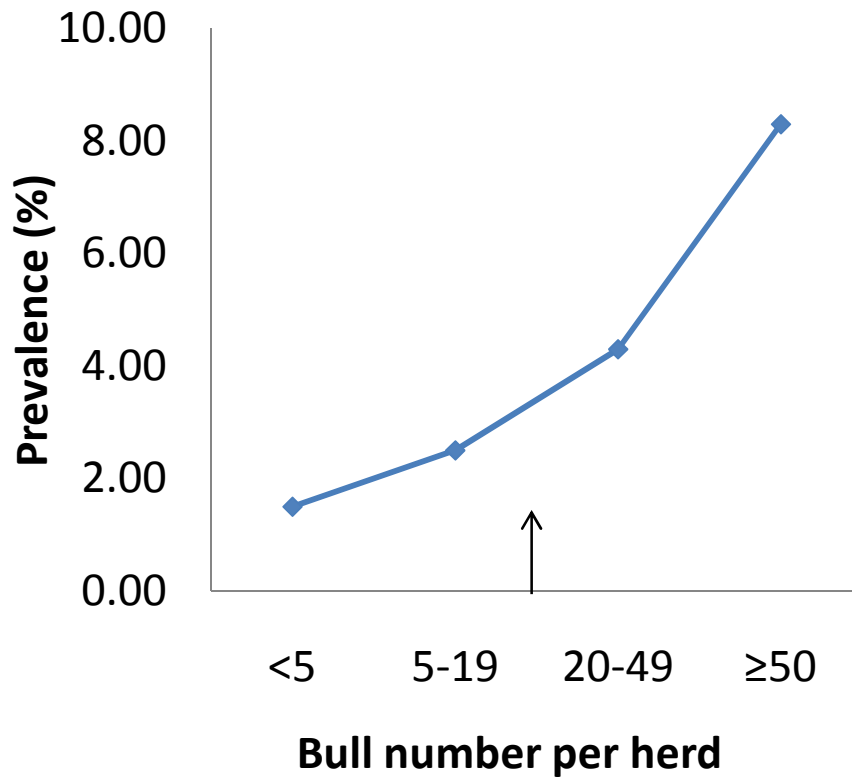
Comingling with neighbor herd(s)

- $p=0.026$
- OR>999.99

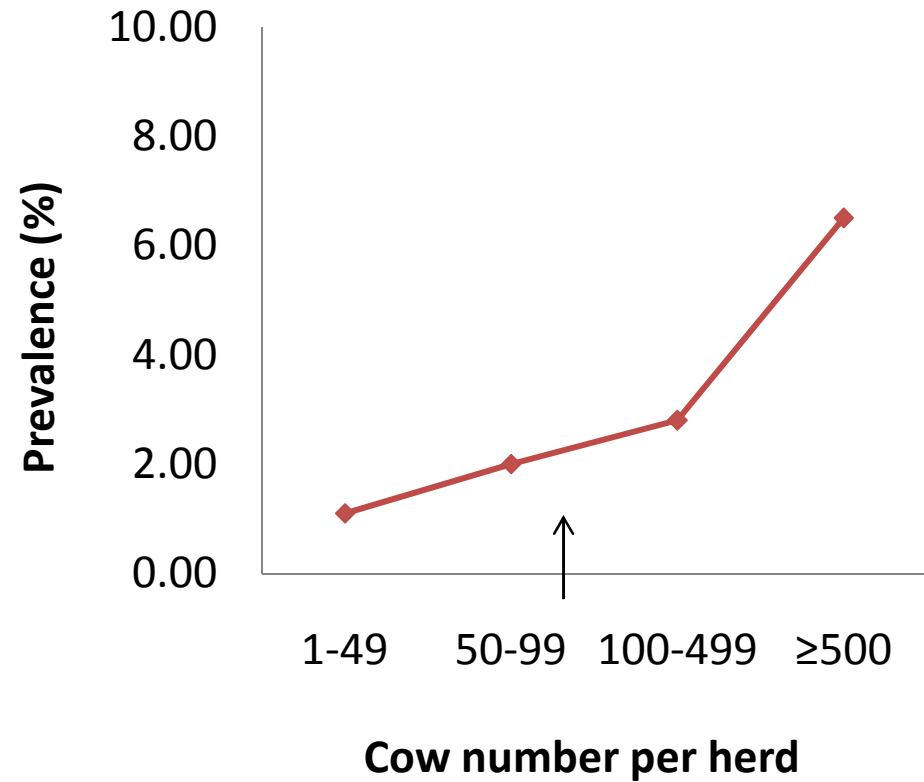
Elapsed time to fix broken fence(s)

- $p=0.078$
- OR=4.3 (0.9-20.2)

Herd sizes and infection chance

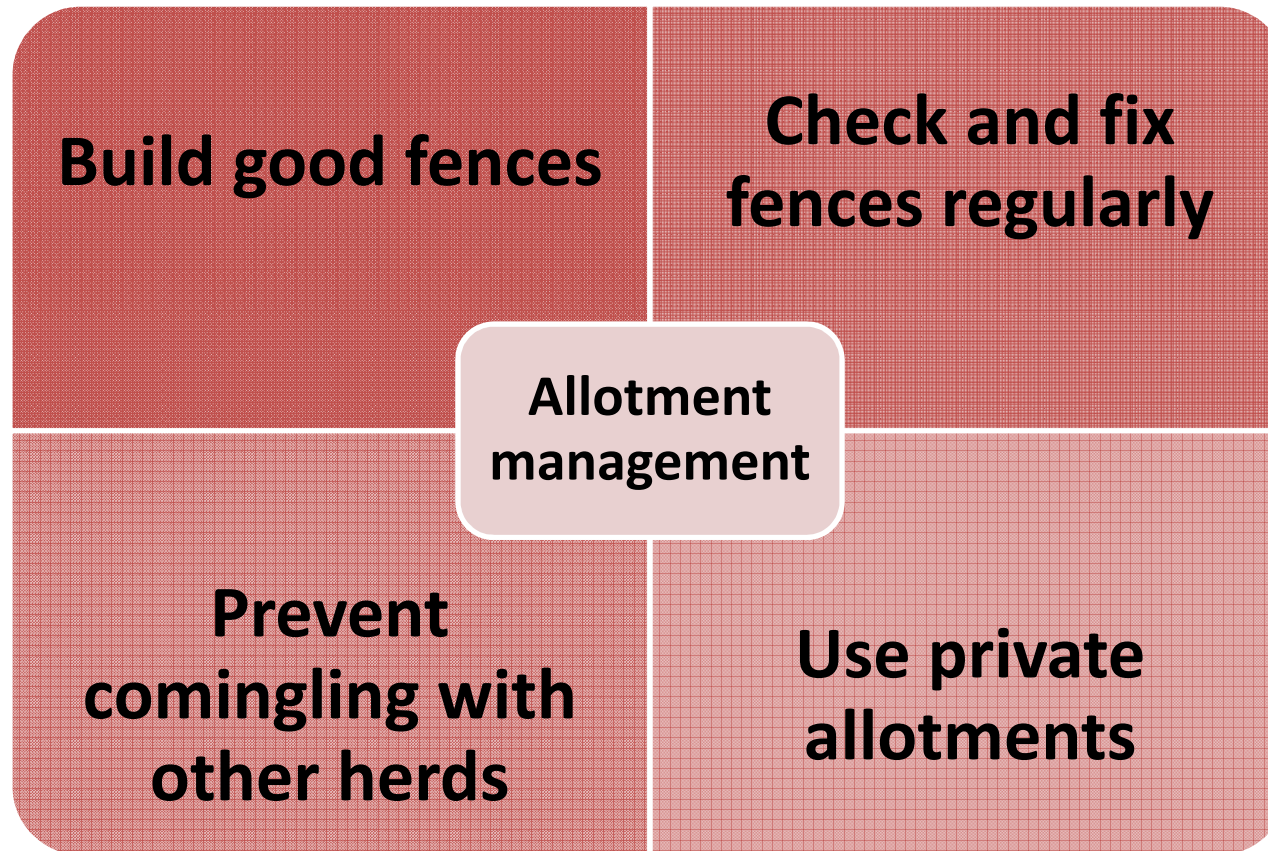


$\chi^2 = 1.834, p = 0.18$

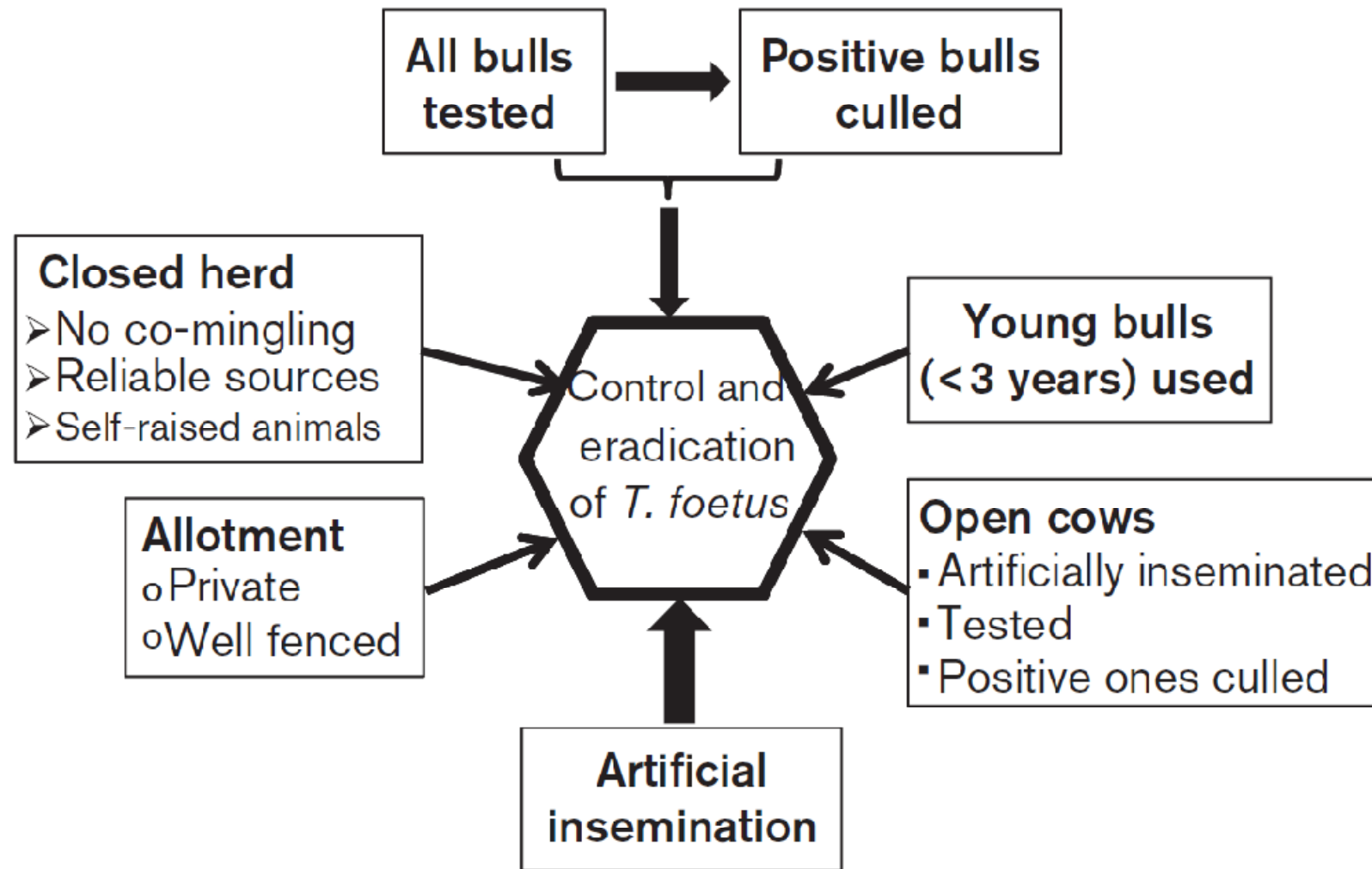


$\chi^2 = 1.266, p = 0.30$

Conclusion



A comprehensive approach to control and eradicate bovine trichomoniasis



Acknowledgment

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