The AERC Pilot Study
"Failure to Finish"

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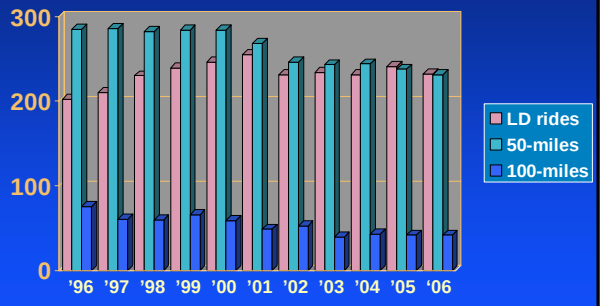
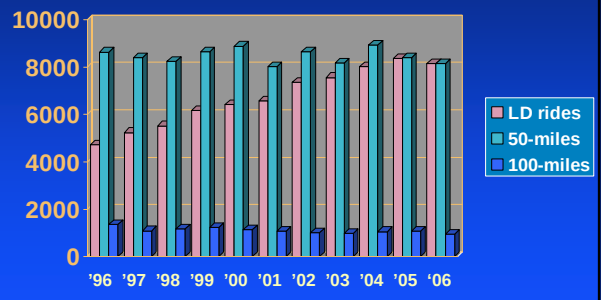
Aims of Talk

1. Review data on rides, completion rates and "failure to finish" found at aerc.org
2. Present preliminary results of AERC-funded pilot case-control study of horses that failed to finish 50 and 100 mile rides in 2004-2005
3. Raise issues that AERC may want to consider to further the effort to maximize completion rates and limit development of lameness and metabolic problems

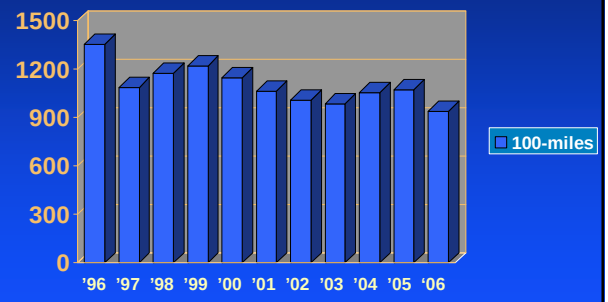
AERC – annual # of rides



AERC – annual # of starters



AERC – annual # of starters

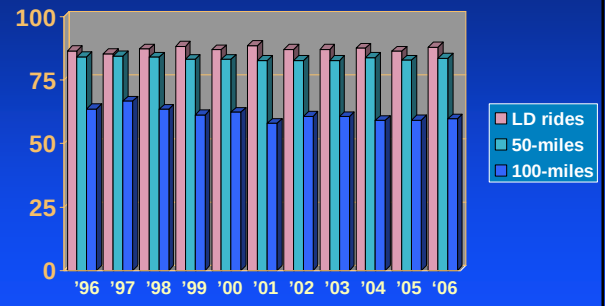


Take home message

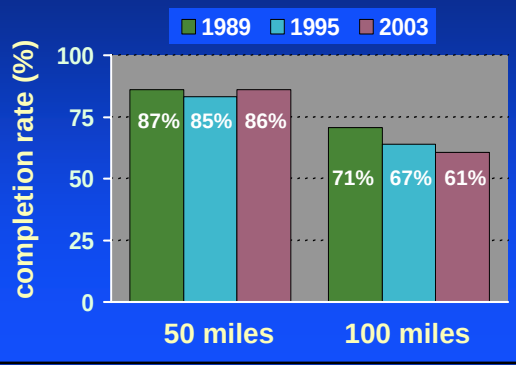
1. Number of LD rides on the increase while the number of 50- and 100-mile rides is decreasing
2. Number of LD starters increasing, number of 50-mile starters steady, and number of 100-mile starters declining
3. Is sport changing - More LD riders and less 100-mile competitors?

AERC may want to focus more attention on LD riders and also ask why there is a trend toward fewer competitive rides

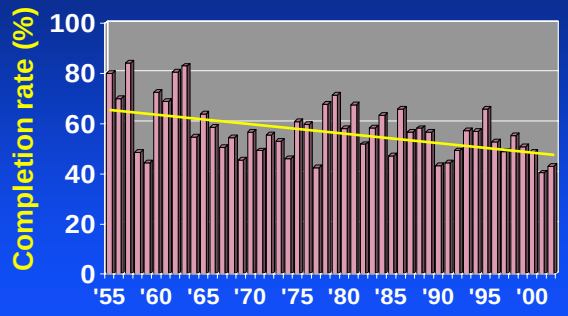
AERC – annual completion rates (%)



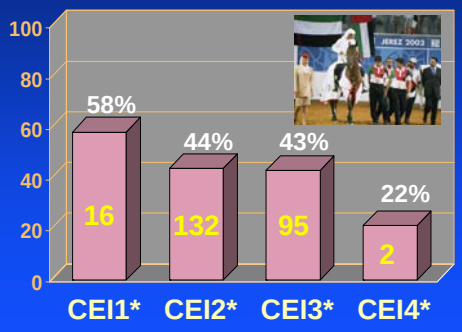
AERC rides – completion rates



Tevis Cup 100 mile ride



FEI rides – completion rates



Questions to consider

1. What is an "acceptable" completion rate for AERC-sanctioned rides?
2. What can be changed in an attempt to improve completion rates?
3. As the sport evolves – should a lower completion rate be expected or avoided?

AERC has a good reputation with regard to equine welfare but the apparent decline in 100-mile ride completion rates may compromise this reputation if it continues

Is Long Distance Endurance Riding Humane for Horses?

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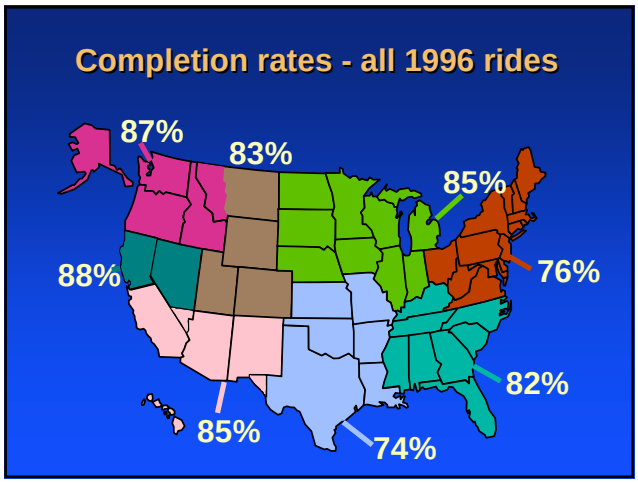
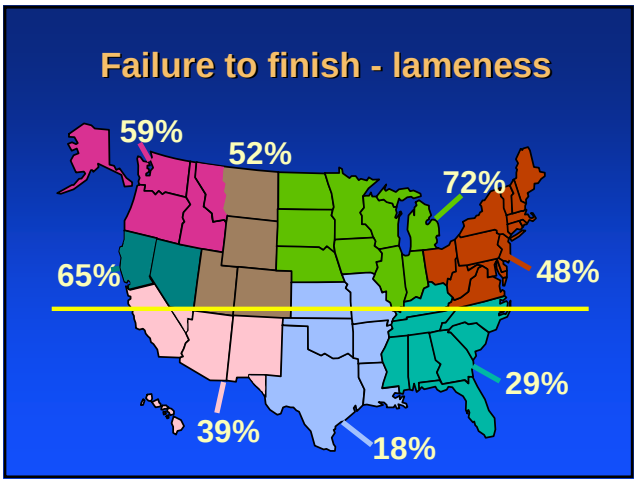
Supported by the Geraldine R. Dodge Foundation

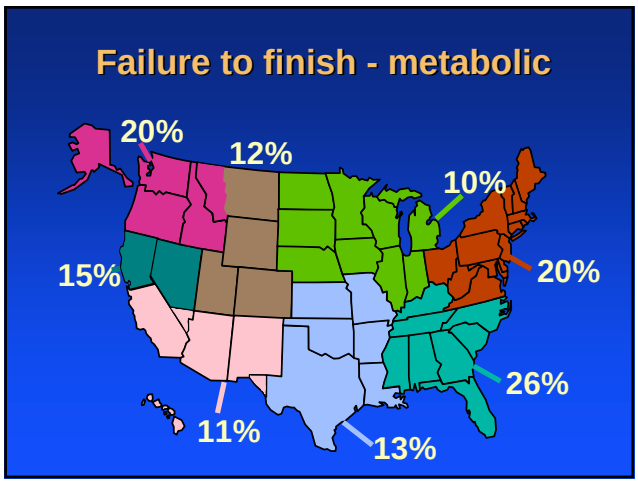
Proc 16th AESM 1997, p. 57-60

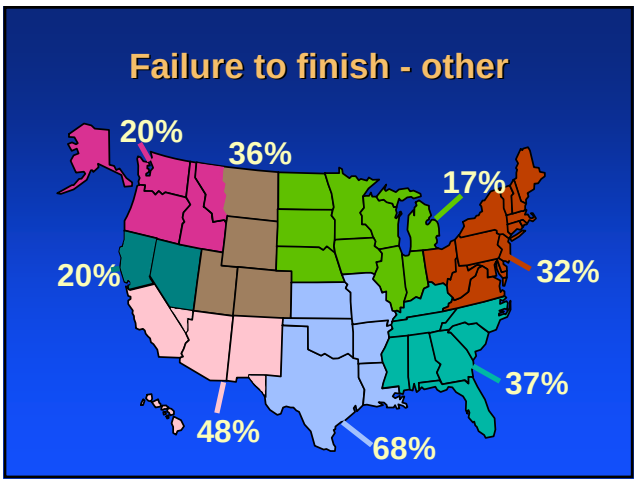
Why do horses "fail to finish"?

- reviewed 1996 vet reports
- lame / metabolic / other


Completion rates - all 1996 rides
87%
83%
85%
88%
76%
82%
85%
74%

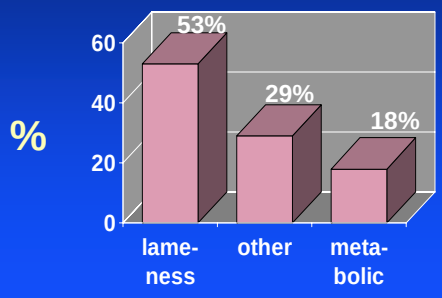

Failure to finish - lameness
59%
52%
72%
65%
48%
29%
39%
18%


Failure to finish - metabolic
20%
12%
10%
15%
20%
26%
11%
13%


Failure to finish - other
20%
36%
17%
20%
32%
37%
48%
68%

Failure to finish - 1996

AERC post-ride veterinary reports



Conclusions

1. Lameness was the leading cause of "failure to finish"
2. Could reporting system be improved? Was use of the "rider option" category being abused?
3. Could more stringent entry requirements improve completion rates in 100-mile rides?
4. Attention to human health was generally poorer than attention to horse health (survey of Michigan ride managers)

1997 - funding requested from AERC to initiate a large-scale epidemiologic study to better describe and identify risk factors for "failure to finish"

Why do horses "fail to finish"

- Lame (L)
- Metabolic (M)
- Overtime (OT)
- Surface factors (SF)
- Disqualified (DQ)
- Rider option (RO)
- Rider option – metabolic (RO-M)
- Rider option – lame (RO-L)

Ribley M. The proper use of pull codes. Endurance News. May, 2005, p. 8

"Where codes become questionable and may be improperly used are with the RO, RO-L and RO-M codes. The RO is to be used *only* if the rider cannot continue or elects not to continue due to their own illness, injury or personal circumstance."

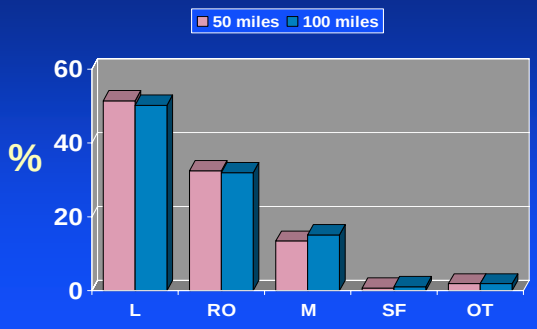
"If a rider is electing not to continue, the horse must still be examined by the ride vet and the horse must be deemed fit to continue in order to use this code. If upon exam the vet determines the horse is not fit to continue, other appropriate codes (L, M, SF) should be listed. The RO code is to be used only when the horse has been examined and passed by the veterinarian."

Ribley M. The proper use of pull codes. Endurance News. May, 2005, p. 8

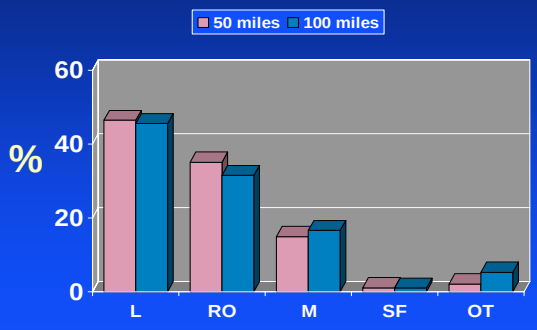
"Similar to the RO code, RO-L and RO-M codes are to be used ***only*** if the veterinarian has examined and passed the horse as fit to continue. If, after the horse has passed the exam, the rider then decides the horse is not right due to either a lameness or metabolic issue, then the RO-L or RO-M codes should be used"

However – this seems to place responsibility on the rider or owner to change an RO to a RO-L or a RO-M (and only identifies problems "after the fact")

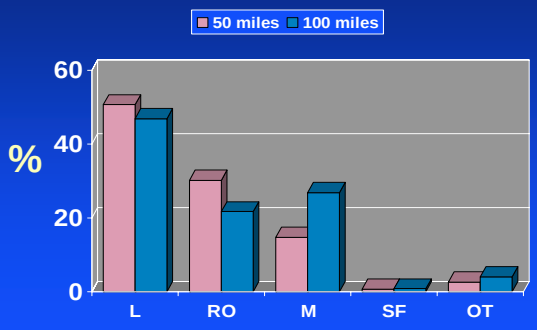
AERC – failure to finish (2003)



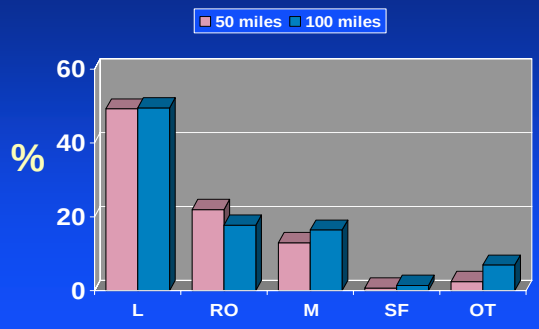
AERC – failure to finish (2004)



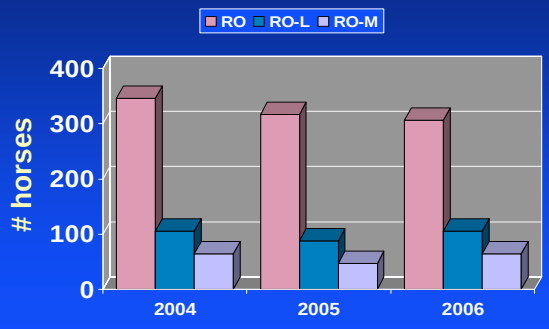
AERC – failure to finish (2005)



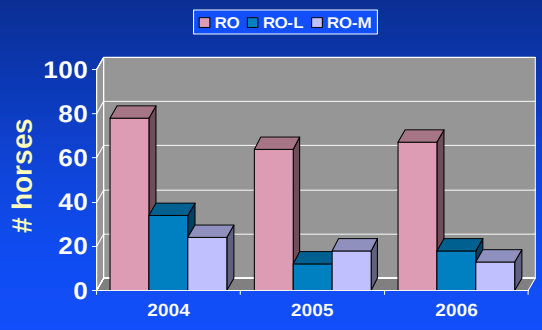
AERC – failure to finish (2006)



AERC – rider option (50-miles)



AERC – rider option (100-miles)



Conclusions

1. Lameness remains the leading cause of "failure to finish"
2. Should purpose of the "rider option" category be reassessed (still used for nearly 30% of "failure to finish)?

Next question – How well do post-ride veterinary reports agree with data posted on the AERC website?

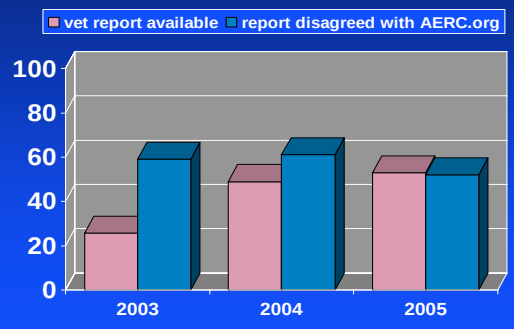
Post-Ride veterinary report

"The Head Veterinarian should complete the Post Ride Statistical Vet Report and return it to ride management to be submitted to the AERC Office. (See copy of this report, Appendix G.)

The Head Veterinarian should make a post-ride evaluation of the ride from a veterinary standpoint, and present his/her findings to management so that existing problems with trail and vet check logistics can be corrected and improvements implemented."

Veterinary Guidelines for Judging AERC Endurance Competi

AERC – post-ride data (2003-05)



Questions to consider

1. Were all forms submitted to AERC forwarded to MSU research team?
2. If so, where is the problem?
   - Are forms being completed for all rides?
   - Are they being forwarded by ride managers?
   - Are they being accurately filed by AERC?
3. Why do forms disagree with website?
   - Many post-ride reports detail multiple rides
   - Numbers on forms frequently do not add up

Challenge to AERC Veterinary Committee – can the current reporting system be improved?

The AERC Pilot Study "Failure to Finish"

Overall hypothesis

Competition in endurance rides results in specific, discipline-related disorders that can be prevented, in many instances, by recognition and avoidance of risk factors

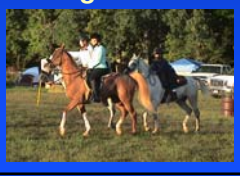
AERC Pilot Study

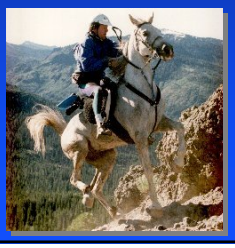
Specific Aims

1. Develop “horse history” and “failure to finish” forms.
2. Use these forms in a case-control study of horses that fail to finish 50 and 100 mile rides in 2004-2005.
3. Use this pilot data to establish a web-based form for subsequent study of all horses that “fail to complete” in all 50 and 100 mile rides in future years.

Horse History Form

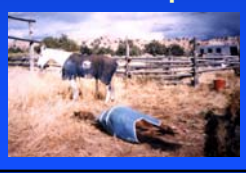
- Signalment
- Rider experience
- Horse experience
- Past performance
- Training
- Feeding at home
- Tack
- General health care





Failure to Finish Form

- Ride and pull specifics
- Potential contributing factors
  - History, trailering, ride conditions, feed changes, use of supplements
- Veterinary evaluation and treatment
- Outcome (return to competition)



AERC Pilot Study

- Contact ride managers one week before ride by phone and e-mail
- Ride managers return information to MSU
  - # riders and # finishers – 50/55 and 100 miles
  - # lameness and # metabolic pulls
  - rider names (and contact information) for pulls
  - rider names (and contact information) for control horses – 2 per pull
  - ride cards – requested
- MSU sends survey form to riders and follows up with telephone call
- Information remains confidential

Case-control approach

- Case = horse that is pulled for either lameness or metabolic problem
- Controls (2) = horses that arrive at checkpoint immediately before and after horse that is pulled
  - required ride managers to retain time sheets for each checkpoint

Data Analysis

- Categorical data from forms entered into Microsoft Access
- Chi-Square and Fisher's Exact Tests performed using SAS
- Significance set at P<0.05

2004-2005 rides

# rides – manager contacted	353
# managers agreeing to participate	155 (43.9%)
# managers that provided data	69 (19.5%)

2004-2005 rides
50 mile pulls and controls

	2004	2005	TOTAL
# 50 mile pull surveys sent	126	191	317
# 50 mile pull surveys completed	82	90	172
# 50 mile control surveys sent	76	140	216
# 50 mile control surveys completed	44	86	130
# 50 mile pull surveys with 2 control surveys completed	1	21	22
# 50 mile pull surveys with 1 control survey completed	3	17	20

42 case-control pairs for data analysis

2004 -2005 rides
100 mile pulls and controls

	2004	2005	TOTALS
# 100 mile pull surveys sent	32	126	158
# 100 mile pull surveys completed	7	59	66
# 100 mile control surveys sent	25	142	167
# 100 mile control surveys completed	7	56	63
# 100 mile pull surveys with 2 control surveys completed	0	8	**8**
# 100 mile pull surveys with 1 control survey completed	0	28	**28**

36 case-control pairs for data analysis

Performance History

- Horses with more rides in their career had an increased probability of lameness pulls
- Metabolic pulls the previous year had an increased probability of lameness or metabolic pulls this year
- Lameness pulls the previous year had a decreased probability of lameness or metabolic pulls this year

Training Intensity

- Training more days per week during the competition season increased the probability of lameness or metabolic pulls
- Training more miles per week during the competition season increased the probability of metabolic pulls

Feeding at Home

- Changing forage type from winter to summer months (hay to pasture) decreased the probability of metabolic pulls
- Decreasing grain amount in the off-season decreased the probability of lameness pulls

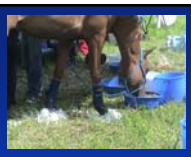
Trailering

- Trailering for a shorter period of time decreased the probability of lameness pulls
- Trailering fewer miles to the competition and unloading more often decreased the probability of metabolic pulls

Ride Conditions and Seasonal Effects

- Hot temperatures (>80°F) on a ride decreased the probability of lameness pulls
  - but did not significantly affect probability of metabolic pulls.
- Competing in the fall (Sept-Nov) increased the probability of both lameness and metabolic pulls

Feeding at the Ride



- Housing on pasture the night before a ride decreased the probability of lameness pulls
- Feeding grain the morning of a ride and feeding grass (grazing) and beet pulp during a ride decreased the probability of both lameness and metabolic pulls
- Use of electrolyte supplements had no significant beneficial or detrimental effects

Ongoing evaluation

- Timing of lameness vs. metabolic pulls
  - metabolic generally earlier in ride
- Further descriptive characterization of lameness and metabolic pulls
  - lameness:
    - ✓ front / hind
    - ✓ cause – lost shoe, others (little information)
  - metabolic:
    - ✓ myopathy
    - ✓ Ileus / colic / exhaustion

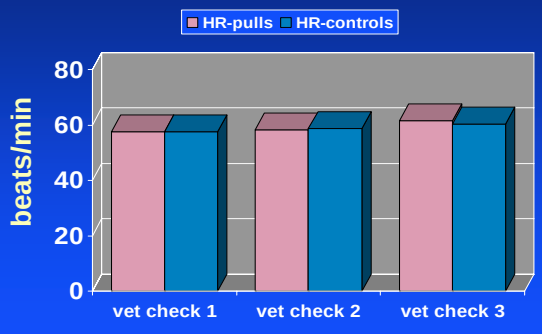
Limitations of study

1. Despite a substantial effort, number of case-control pairs remained small
   - 50-mile lameness pairs =
   - 50-mile metabolic pairs =
   - 100-mile lameness pairs =
   - 100-mile metabolic pairs =
2. Asking the "right questions" on survey forms remains a challenge
3. Goal of "randomizing" data base could not be accomplished

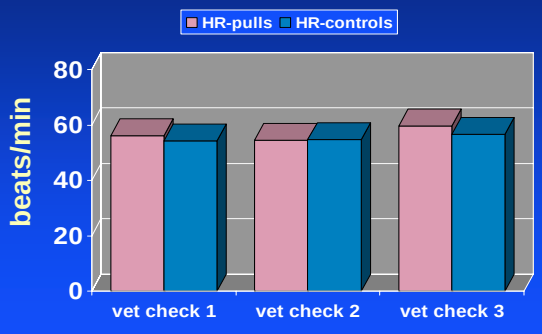
Ride card evaluation

- Limited sample size for analysis
  - 50-mile lameness pairs = 12
  - 50-mile metabolic pairs = 4
  - 100-mile lameness pairs = 9
  - 100-mile metabolic pairs = 5
- Compared HR, gut sounds, gait, and "overall" assessment scores

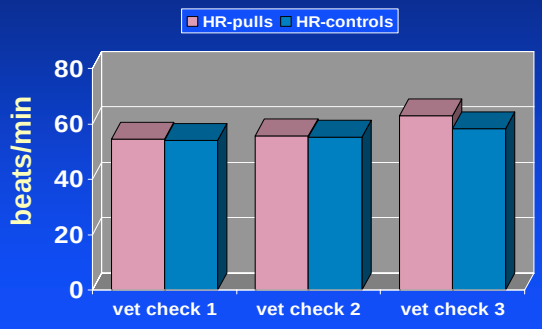
Ride card – HR (P&R crew)



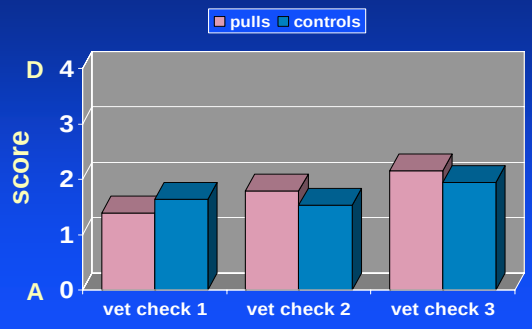
Ride card – HR (pre-CRI)



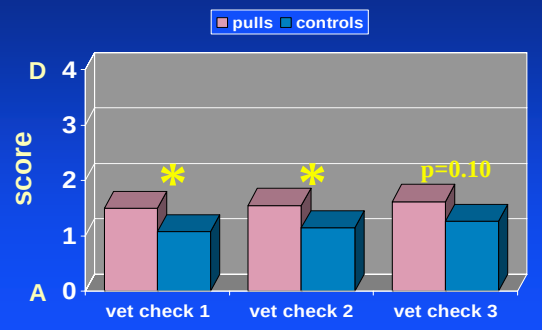
Ride card – HR (post-CRI)



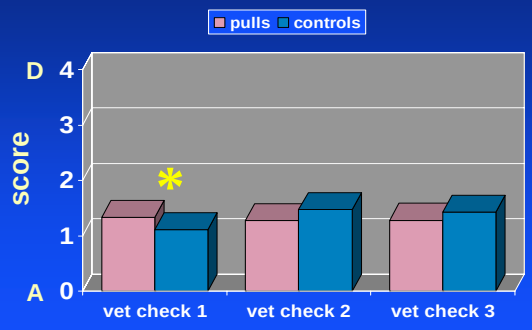
Ride card – gut sounds



Ride card – gait



Ride card – overall impression



Ride card evaluation

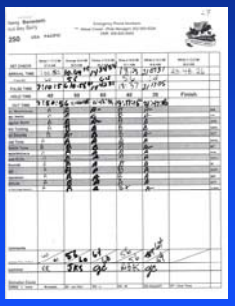
- No differences between pulls and controls:
  - attitude, impulsion
  - MM, CRT, jugular refill
  - skin tenting, anal tone

Should ride cards be scrapped?

Should ride cards be simplified?

Ride card evaluation

- Dependent on quality of data recording



Some are fairly good

Many could be better

Where to go next?

1. Recommend AERC consider expanding pilot study to a larger scale epidemiologic study utilizing a web-based reporting system
   - would require a carrot for the riders
   - would require some commitment ($$) to web development and ongoing survey evaluation
   - would require an ongoing and sustainable commitment to research (fee per ride entry)
2. Determine whether regional differences exist
3. Further document discipline-specific musculoskeletal and medical problems and prognosis for return to performance

What problems might be solved?

1. Unlikely to prevent failure or deaths
2. May help to improve completion rates, especially in 100-mile rides (but this could probably be done with stricter entry criteria already)
3. Has the potential to improve care and recovery of horses that "fail to finish"
4. The "right thing to do" to move forward

Thank you for your attention!