DRAFT AGENDA
AERC BOD Conference Call 11/12/18, 6 p.m. PT

Call to order and roll call
Housekeeping:

Acceptance of agenda

Approval of 9/10/18 board conference call meeting minutes - ### below

Excusals –None as of October 29, 2018

Statistical report – Kathleen – to be furnished before the meeting.

Business before the Board:

Sanction approval, West Region, Torrey Creek Pioneer 5/24 – 26/19, a 25/50, 30/55, & 25/50 with the LD portion beginning at 8 am each day and the Pioneer distances beginning at 7 am each day. Erin Riley Kelley is the RM, and Andrew Gerhard has given his approval for the ride and forwarded to the Sanctioning Committee for consideration.

Sanction approval from the National Championship Committee regarding the 2019 NC ride – Twenty Mule Team 35/65/100, Brian Reeves and Robert Ribley will be co-managers, basecamp location: Desert Empire Fairgrounds, Ridgecrest, CA (ride has been held for the past 35 years).

Motions before the board:
Limited Distance completion rule change, %%% below – Rules Committee
Funding for 2019 Tevis Research, @@@ below – Research Committee

USEF discussion – Mr. Bill Moroney, USEF CEO, will be joining the call.

AERC 9/10/18 Conference Call meeting minutes

The meeting was called to order by President Paul Latiolais at 9:03 pm
Present were- Paul Latiolais, Monica Chapman, Connie Caudill, Tonya Stoud-Oaks, Mary Howell, Nick Kohut DVM, Michael Campbell, Susan Kasemeyer, Marcia Hefker-Miles, Shawn Bowling, Andrew Gerhard, Olin Balch DVM, Terry Woolley Howe, Mike Maul, Christoph Schork and Executive Director, Kathleen Henkel.
Michael Campbell asked to add to the agenda a discussion on the Horse Excellence Award.
Connie Caudill moves to accept the revised agenda and Nick Kohut 2nd. Motion passed
Christoph Schork made a motion to excuse Lisa Schneider for medical reasons, Susan Kasemeyer 2nd. Motion passed. Susan Kasemeyer asked for excusal of Jan Stevens, Bob Marshall DVM, Mollie Krumlaw-Smith and Heather Reynolds. Nick Kohut 2nd the motion. Motion passed
Statistical Report from Kathleen Henkel
Membership as of 9/11/17 4897
Membership as of 9/10/18 4793
Sanction fees as of 9/10/17 $ 16,112
Sanction fees as of 9/10/18 $ 14,750
Rider fees as of 9/10/17 $ 58,518
Rider fees as of 9/10/18 $ 48,352
New members as of 9/11/17 533
New members as of 9/10/18 542

Nick Kohut DVM made a motion to accept the 8/4/18 midyear Board meeting minutes. Olin Balch DVM 2nd. Motion passed

Michael Campbell made a motion to approve the Petition for FEI for Horse Welfare Reform, 2nd by Susan Kasemeyer. Connie Caudill stated even though the Board approved the petition on e-mails, that AERC needs to make it official. This petition has been on the Change.org website site for 2 weeks and has over 5,000 signatures. (The petition is below) AERC wants true reforms for FEI endurance, especially having riders maintain a 66% completion rate to participate in open speeds, revise coc and stiffer penalties for drug abuse. Motion passed unanimously. (The full Petition below the minutes)

Mary Howell presented a motion from the Sanctioning Committee for the approval of the Pine Tree Pioneer Ride to be held August 7-9, 2019 in Maine. Motion passed

Michael Campbell discussed options for funding the new Horse Excellence Award. Promotional info will published in Octobers Endurance News. AERC will put out a news release. The Board will vote on the best candidates. The cost was estimated to be $2,000. Michael Campbell would prefer the Board members fund it. Olin Balch DVM suggested that AERC should be stand behind this award financially since it is supporting AERC's basic principle for longevity of the horse. Christoph Schork agreed that AERC should be presenting this award not the AERC Board.

Olin Balch DVM made a motion that funding for the award is to come from AERC. Christoph Schork 2nd. Olin Balch DVM accepted a friendly amendment from Connie Caudill that AERC was to fund this for one year and then the Board would revisit. Marcia Hefker-Miles stated that the intent of this award is to extend the arm of clean endurance internationally. Motion for funding passed

Olin Balch DVM requested that Board members that will be attending the WEG to give a report.

Susan Kasemeyer moved to adjourn at 9:40 pm, Marcia Hefker-Miles 2nd. Motion passed

Submitted by Connie Caudill

Global Petition for FEI Horse Welfare Reform

The purpose of this petition is to clarify for FEI that the endurance riders and supporters worldwide demand a return to the traditions of our sport with emphasis on the proper care for endurance horses everywhere by allowing the horses to compete on their own natural abilities without performance enhancing drugs. The petition also requires increased rest periods for excessive speed and stiffer penalties for those who would abuse these animals. This petition has the support of 25 American Endurance Ride Conference Board members and we expect the public support of relevant committees and organizations from endurance organizations all around the world.

FEI must take a stand for endurance horse welfare reform worldwide before equestrians lose the privilege of competing in equestrian sports. We request that FEI accept and enforce the following 9 rules that will punish the cheaters and abusers of horses that believe in "winning at all cost". Enough is enough, endurance athletes and horse enthusiast globally demand change in the FEI organization.

1. Increase penalties for positive drug tested horses- Higher fines as well as stiffer suspensions on the horses. At least a year suspension (not the current 2 months). (May depend on the type of drug))

2. Strong penalties on Trainers/Athletes/Owners who have 3 positive drug violations within a 5 year period. (5 year suspension)

3. Positive drug violations for anabolic steroids, (such as testosterone) the horse will be banned for life. Possible life ban on –Athlete/Owner/Trainer

4. Have mandated drug test on all 4* and 5* and Championship rides. Increase the drug testing fees in this type of race to help pay for the extra testing. Take a blood draw on ALL at check in (hair follicle possibly in future drug testing programs). At the finish always drug test top 10-20 horses in these types of races, then others at random. (4* is a 160K with prize money of $10,000-$50,000, 5* prize money greater than $50,000)

5. Check for sensitivity of the horses' lower legs at initial vetting, during the ride at the vet checks and upon completion. Strong penalty for violation.

6. Athletes/horses must maintain a completion rate of 66%. If either fall below a 66% completion rate (Retired/Rider Option will not count against them) they will immediately go back to restricted or controlled speed (which currently is no greater than 16kmh or 10 mph). They will stay at this rate for at least 6 months and if their completion rate has improved above the 66% they can go back into open speed, if it has not improved they will remain in the controlled speed category another 6 months until they can improve their completion rate.
7. Remove elite athlete status. (Elite status only comes into play at championship rides). All athletes must qualify on the horse that is to be ridden in the championship ride, no special status for elite athletes.
8. Eliminate current COC timing. (This promotes fast flat courses only.)
9. Increase rest periods for all horses that exceed average speeds of 16kmh (10mph). Reduce rest period by 50% when average speed is less than 16kmh (10 mph).

MOTIONS:
%%% AERC Board of Directors
MOTION PROPOSAL

This Motion Proposal form is to be used in the development, presentation and approval process of submitting motions to the Board.

Motion Name : Limited Distance rule modification

Proposing Committee: Rules

Date of Motion : November 12 teleconference call

Classification of Motion Request : rule change

Proposed Motion :
Whereas existing LD finish/completion rules often result in confusion and rushing to meet time and veterinary/pulse criteria,
Resolved to change the following rules: (deletions to current rule book are noted with cross-out line, additions with bold, italic)

1) Rule L3:
L3. The ride must provide a specific amount of time (total competition time) which will include all stops and holds, and within which competitors must complete the ride to qualify for placing or completion.
L3.1 There may be no minimum time limit for completion.
L3.2 Course completion time, which is the maximum time competitors are allowed to complete the specified course from start to finish, will be according to the Limited Distance chart in Appendix A.
L3.3 Riding time is the time used by competitors to complete the course and reach criteria, excluding all hold times. This is the time used for AERC ride results.
L3.4 At the finish, ride time of the competitor continues until a pre-set judging criteria of 60 heartbeats per minute or less is met. (Finishing time is recorded as the time at which the rider asks for and subsequently meets this preset criteria.) ~~There is no marked finish line on the course that is used to determine placing or completion time.~~
2) and change the Limited Distance chart in Appendix A to read:
Limited Distance Maximum Course Time Hours:Minutes
(time rider must be off the marked course, including all Holds and Checks)
and
3) Rule L4

~~L4. Completion requires meeting all of the criteria used for endurance rides with the following exception/additions:~~

L4. Completion requires meeting all of the criteria used for endurance rides with the exception of maximum pulse criteria upon completion of the course (see L4.1.2)

L4.1 All equines must stand a mandatory post-ride evaluation within ~~30 minutes~~ one hour of crossing the marked finish line. Riders may present their equines for the final examination at a time of their choosing during the ~~30-minute~~ one hour period. An equine that does not meet the established criteria within ~~30-minutes~~ one hour of arrival time shall be disqualified. Once a completed equine has passed the post-ride examination, it may not be removed from completion for veterinary reasons.
L4.1.2 The equine must meet a reasonable pulse recovery based on ambient conditions within 30 minutes of arrival at all control points. Maximum pulse criteria upon completion of the course is 60 beats per minute, and must be met within 30 minutes of arrival ~~upon completion of the course~~ at the finish line. Respiration should be evaluated on its own merit. Ambient temperature and humidity effects need to be recognized and their effects considered.
Implementation plan : Article in Endurance News, immediate notification of all members via email.

@@@AERC Board of Directors

MOTION PROPOSAL

This Motion Proposal form is to be used in the development, presentation and approval process of submitting motions to the Board.

Motion Name: Request for Funding for AERC Research at the 2019 Tevis Ride (see attached protocol)
Proposing Committee: AERC Research Committee – Jerry R. Gillespie, Chair of Research Committee
Date of Motion: 15 October 2018
Classification of Motion Request (new, change, add, delete, by-law, rule, policy): Postponed Research

Proposed Motion (use exact wording): This is a request to reinstate funding that was approved for the 2018 Tevis Dehydration Study, which did not occur because of illness of one of the Principal Investigators. AERC was notified 11 May 2018 of the need to postpone the Tevis Research, and a request to refund the project for the 2019 Tevis Cup Competition. The funds requested herein are in the same amount as those requested for the 2018 Research.
It is moved that AERC provide funds in the amount of $4,000 from the AERC Research Fund to continue our studies on dehydration of endurance horses traveling to the 2019 Tevis Ride and during the Ride. (see attached proposal) I am attaching a budget request in which I propose the AERC and the Tevis Foundation share in the cost of the proposed 2019 Tevis study; $4,000 funded by AERC and $2,450 funded by Tevis Foundation; TOTAL $6,450.

Background, analysis and benefit (describe the problem this motion is solving): The proposed Tevis Research will be an extension of the AERC Research at the 2016 Cooley Ranch Ride and

the 2017 Virginia City Ride. The results of these studies were report at the 2017 and 2018 AERC Conventions. (more background in the attached Research Proposal)

Budget effect/impact (Attach spreadsheet if appropriate): We anticipate no budgetary impact on AERC. The requested funds will come from the AERC Research Fund.

Benefit and/or Impact to Membership and/or the AERC Organization: Of great concern to the Membership and the AERC Organization is the welfare of the endurance horse. Like the earlier studies at Cooley Ranch and Virginia City Rides, the 2019 Tevis Study will focus on a very important ailment in endurance horses, dehydration. Our studies have shown that horses dehydrate (loose body water) during transport to rides if the journey requires more than 2 hours. The horses do not usually have time to rehydrate before the start of the rides and will continue to dehydrate during the ride in both 50 mile and 100 mile rides. It will be important to investigate the extent of dehydration in the Tevis horses during a 100 mile ride with ambient temperature around 100 degrees F. We expect to collect home-stable body weights and ride-arrival weights to assess the extent of dehydration do to transport to the Tevis venue.

Impact on AERC Office (Work load, budget): Minor

Committees consulted and/or affected: No Other Committees consulted. However the information from these studies should enrich presentations in the Education Committee, Inform members of the Veterinary Committee, and provide guidance to the Ride Managers Committee Supporting materials (List of any other documents and/or spreadsheets): Attached Research Proposal with budget and budget justification.

Supporting approvals (proposing committee, participating committees) AERC Research Committee

I. **Title**:

Tracking Body Fluid Losses and Gains in Competing Horses During The 2019 Western States Equestrian Endurance Competition Period.[1]

Abstract: Previous studies have shown that horses competing in endurance rides loose body weight (BW) associated with their loss of body fluid and electrolytes, and these losses average nearly 5% of pre-ride body weight, and may be as large as 10% of BW or more in some horses. Under these short-term circumstances, the BW losses are deduced to be losses in body water through sweating, (as much as 100 liters in some endurances horses following a 50-mile competition). There are feces and urine loss from the body during travel and competition that are small compared to the fluid loss associated with sweeting, and because of their relatively small mass (weight), these losses are ignored in previous and in our dehydration studies.

It has been shown that horses also loose BW during transportation, which is due to body water loss (i.e., dehydration). Dehydration levels in horses during transport increases with ambient temperature and distance of transport.

It has been noted by investigators and control veterinarians at endurance rides, that the percentage of body weight loss from start to end of the ride does not relate well to the onset of dehydration-related ailments. This poor relationship may be because all horses do not start at the same hydration level, i.e., there may be a large variation in the hydration level of horses at the start of the race relative to their homeostatic hydration level. If one assumes that most horses are in a ***homeostatic hydration level*** (normal hydration) at their home stable, then their BW at rest at home could be used as a baseline for fluid loss/gain during transportation to the ride and during the ride. Variation from the homeostatic BW would represent the ***absolute hydration level*** during and following the ride.

We hypothesize that the ***absolute hydration level*** of endurance horses during an endurance ride would likely affect to their performance in the ride and their

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[1] An Endurance Competition Period (ECP) includes *six phases*; a. during travel to the race site, b. during rest at the race site prior to the competition (usually overnight), c. during each segment of the competition, d. during the rest at the race site after the competition and prior to transport home, e. during transport home, and f. during recovery-rest at home.

subsequence susceptibility to dehydration-related ailments. We will test this hypothesis by collecting/measuring horse body weights at the following sites; a) garnering home-weights of horses prior to their travel to the 2019 Western States Equestrian Endurance Event (WSE), b) upon arrival at the WSE-site (i.e., the Auburn Fair Grounds &/or the Robie Point and/or the Auburn grounds, c) at several veterinary exam points along the WSE, d) at the finish, and e. twelve (12) hours after the horses finish the event, and e) garner data from horses within 24 hours in their home environment. We will correlate these findings to performance and health measures for each horse during the ride.

II. **Investigators.**

Principal Investigator:
Jerry R. Gillespie, DVM, PhD
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Co-Principal Investigator:
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Collaborators:
Cheryl Langbein, DVM
Santa Rosa, CA

Statistical Consultant:
Aki Tanaka, DVM, PhD.
UCD, Davis, CA

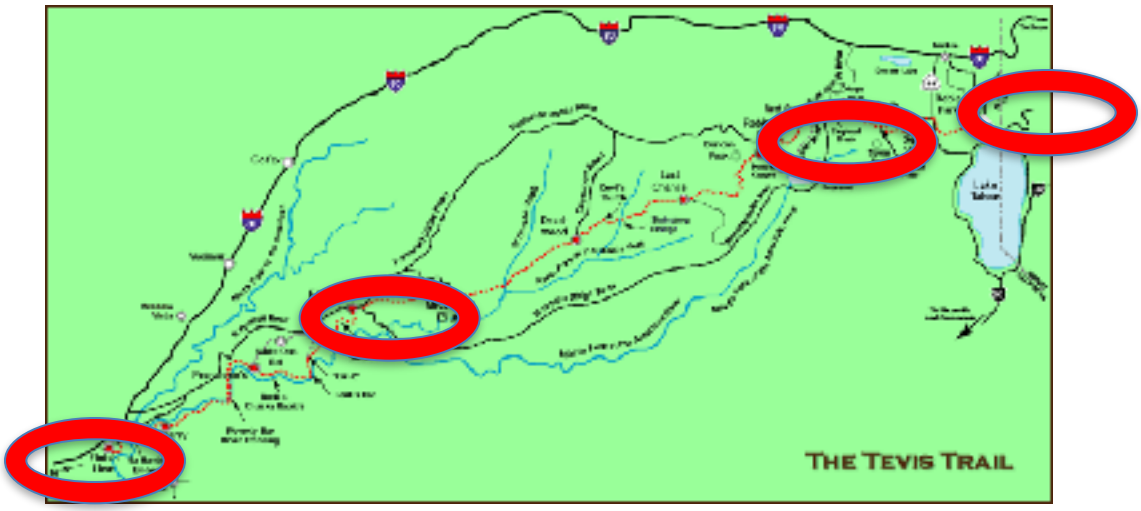
Western States Veterinarians (to be named)

IV. **Study Proposal.**

1. **Hypothesis:** The horses that encounter metabolic ailments during or after an endurance competition have the greatest ***absolute losses of body fluids and electrolytes*** as a function of their baseline body fluid level in a stable, low-stress, homeostatic environment, e.g., their home-stable environment.

2. **OBJECTIVE OF STUDY**: To estimate the *absolute* changes in hydration, as measured by body weight changes from their homeostatic hydration (home-stable weight), that occur in individual endurance horses during the six phases of an *Endurance Competition Period (ECP);* a. during travel to the race site, b. during rest at the race site prior to the competition (usually overnight), c. during each segment of the competition, d. during the rest at the race site after the competition and prior to transport home, e. during transport home, and f. during recovery-rest at home. We will correlate the absolute hydration status of each horse with its; a) veterinary scores at each checkpoint, b) rate of travel in each segment of the competition, c) the placement in the competitions, and

d) its veterinary evaluations at each veterinary check point and finishing veterinary score prior to departure from the ride site.



---- Proposed weight sampling sites during the competition.

3. Justification, Significance and Literature Review:

Justification and Literature Review: The Principal Investigator for the proposed study has completed studies of the weight loss during transportation to a ride (2016 Cooley Ranch Ride; two 50 mile and two LD competitions and a 100 mile competitions, 2017 Virginia City 100, VC100) and during and following these endurance competitions. The results of the 2016 Cooley Ranch Ride studies have been reported at the Veterinary Continuing Education Course in conjunction with the American Endurance Ride Conference (AERC) 2017 Annual Convention. The results of the Virginia City 100 (VC100) study will be reported at the 2018 AERC Convention (Reno).

To gain a more complete understanding of the dehydration of endurance horses in a 100-mile competition, it is important that we extend our study form the VC100 to another premier 100-mile competition. Ideally, that 100-mile competition will be the 2019 Western States Endurance Ride (Tevis). We are proposing a study that will follow our protocol that has been successful at the Cooley Ranch Rides and the 2017 VC100. Here is a partial list of why the Tevis dehydration study is important:

1. Our previous studies have shown the importance of the dehydration during travel to the event. More recently, our 2017 VC100 studies also showed travel-dehydration, however the numbers of participants in this portion of the study were small, and large numbers are needed to confirm travel-dehydration in endurance horses. This is important to better understand what factors during transportation contribute to the loss of body water. It is very important that we have a standard homeostatic home-stable weight for comparing to the weight changes that occur throughout the Endurance Competition Period (ECP).
2. The temperatures throughout the ride period at the VC100 were cool (40 – 50 degrees F.), which is in contrast to the much warmer temperatures expected at the 2019 Tevis, and encounter during our previous studies of dehydration at endurance events.
3. The rocky trails at the VC100 substantially limited the speed of the horses and their level of exercise work. Because they travelled slowly many horses were not able to complete the final loop, which limited our data-collection in the last part of the ride.

There have been studies of hydration in horses during most of the six phases of the Endurance Competition Period (ECP), but there have been only limited studies that follow the hydration of the same horses through several phases and none that followed changes in all phases. While knowing the relative changes of hydration during each phase for groups of horses is informative, the sequential changes in hydration of individual horses through all the phases is important if we are to know the full magnitude of dehydration during and following a competition of individual horses. The complete hydration-profile of horses during the ECP might explain why some horses with 10% body weight (BW) loss during competition show severe clinical signs of exhaustion/dehydration following an endurance competition, and others with the same percentage of weight loss show no clinical signs and place high in the competition (15,26). These horses may have started at very different *actual hydration levels* depending upon their relative losses and gains during the first two phases of the endurance competition period.

For example, if we presume that a horse kept in a low-stress, stable-home environment will have a normal or physiologically sufficient total body hydration level, then based upon previous studies (1-4), we can assume that these horses will become dehydrated during transport (the longer the distance and the higher the ambient temperature in the vehicle the greater the loss of weight and greater dehydration) (1,2,4). Recovery during rest (e.g., overnight rest prior to the start of an endurance competition) with free access to water facilitates rehydration, but the extent of rehydration is variable and may require more than 24 hours (15). There are few studies that have data on these

critical times leading up to the start of an endurance competition, and these periods (transport-period, and pre-ride rest period) are critical in determining the *actual hydration-status* of a horse starting an endurance competition.

Friend et al, and others (1-4) have shown that horses dehydrate during transport, which would be associated with "phase a," in the ECP. Several studies have demonstrated dehydration during endurance competition (5-15).

There is extensive literature (5-15) describing dehydration during endurance competitions of different distances. Horses show a substantial fluid and electrolyte loss during the first segments of endurance competitions (7,8,13,15,24). The rate of dehydration during the later portions of the competition has been shown to slow in most horses (7,8,13,15,24). There are very few studies following the body-hydration profile in endurance horses during the 12 to 24 hours following the competition (15), but in general horses appear to gain body water back slowly requiring more than 24 hours to fully return to pre-competition values (15). The rate of drinking and rehydration has been shown to be greatest in horses administered electrolytes per os, during and following competitions (15,19,26).

In a review paper (Challenges of Endurance Exercise: Hydration and Electrolyte Depletion, Proceedings of the 2010 Kentucky Equine Research Nutrition Conference, 94-111)(15), H. C. Schott thoroughly described the changes in electrolyte and fluid (body water) occurring in horses during competition in endurance rides of different distances (25 to 100 miles). In brief, several investigators have shown changes in body weight; packed cell volume; blood protein concentration; and electrolyte changes associated with dehydration in horses during competition (5,6,13,14,17,23). These changes in hydration have been associated with a variety of serious ailments in horses in endurance competitions; such as colic, "exhaustion syndrome," cardiovascular collapse/failure (5-25) although, the pathogeneses of these ailments in individual horses have rarely been confirmed, i.e., no direct relationship between extent of dehydration and these ailments have been confirmed (15). However, there is strong clinical evidence that shows that prompt and aggressive intravenous fluid replacement will often reverse clinical signs of these ailments and prevent progress to severe, debilitating symptoms and/or death (15,23). Most endurance horses appear to be able to tolerate significant body fluid loss during endurance competitions, and it is not unusual for successful horses to loose 10% of their body weight during competition and show no ill effects following the ride (15,26)

There are at least three major metabolic syndromes, which have been associated with dehydration of endurance horses during competition: a) colic,

b) exhaustion syndrome, and c) cardiovascular shock/failure (16-25). The pathogeneses of these syndromes have not been completely documented in the endurance ride environment, and the exact role of body fluid and electrolyte loss during endurance competition in these syndromes has not been proven (15,24). Further, the clinical signs associated with these syndromes appear to overlap in many horses during or following competitions. Clinically, it is recognized that any of these three syndromes, alone, or in combination can cause severe discomfort/pain and not infrequently lead to death of horses if not treated aggressively soon after detection of clinical signs (19,23,24). The clinical signs of these syndromes appear to be frequently reversed with aggressive intravenous administration of 15 or more liters of electrolyte-balanced fluids (15).

Significance: This will be an important extension of our studies of hydration in endurance horses during all phases of an (ECP). Our aim is to estimate of horse's absolute hydration status and correlate it with measures of performance of each horse in the study.

4. Experimental Methods and Design:

a. Venue: 2019 Tevis Endurance Ride

b. **Horses in the Study:** The Researchers and their volunteers will work with the Tevis Ride Management to recruit rides to participate in the study. We will make every effort to make participation non-invasive to the riders riding enjoyment or success. We anticipate no interference with the normal conduct of the ride by the veterinarians and ride officials.

c. **The core of the study** to add to the already existing data on dehydration in endurance horses during competition, it is important that we recruit riders to garner home-stable weights within a week's time prior to departing for the Tevis venue. In addition to the home weights, we will collect weights of horses at the Tevis venue with two very accurate, large-animal, electronic scales. During the transport we propose to provide 5 riders with sensors to record trailer temperatures and humidity. These instruments are very small but record temperature and humidity values every few minutes. The data can be downloaded later from these devices. Readings will be taken no less than every 15 minutes during the conveyance.

d. **Protocol for collection of home weights:**

The HOME-STABLE WEIGHT and other weights during the ride will be very important to increasing our understanding of dehydration in horses competing in 100 mile endurance rides.

If competing horse's home-stable is more than **one hour travel** to the Tevis base camp (Robie Park) or Auburn Fair Grounds, we will request riders to weigh their horses at their home stable, before departing for the Tevis venue. We will assist riders in identifying certified scales in their neighborhoods. Some general locations are:

- Feed stores
- Veterinary practices
- Facility where large trucks are weighed (gravel, rock, soil retail plants)
- Municipal/county refuse plants (dump, landfill)
- Private ranch scales

Most California Counties have a Department of Weights and Measures, usually in conjunction with their Agriculture Department. Persons in this department can tell riders where he/she can weigh their horses.

When do riders need to collect their horses' home-stable weights? The closer to the time of their departure for the Tevis the better, but weights within a week of their departure will be satisfactory.
It is important that riders weigh their horses on a scale within ***one hour's travel distance*** from your stable.
If riders live within 1 hour travel time to the Robie Park or Auburn Fairgrounds we will collect their HOME WEIGHT upon his/her arrival-weight at one of the Tevis staging venues.
Please contact Jerry Gillespie (jerrygillespie222@gmail.com or 530/867-4394) if riders have any questions about the 2019 Dehydration Study.

e. **All horses entered in the Tevis will be included in the study:** It is important to note that we will be available to weigh all horses in the 2019 Tevis Competitions regardless if they were able to gather home stable weights.

f. Protocol for the study at the Competition site. The study will be divided into eight sections for weighing horses at the Tevis event site;

i. Arrival. We will set up scales several days ahead of the start of the ride and locate them at arrival points, Robie Park and the Auburn Fair Grounds. We will encourage riders to weight their horses as soon as possible after arrival at these Tevis staging areas.
ii. Pre-ride veterinary check. We have found that if we weigh horses immediately after the veterinary exam at each site, we cause minimal (no) disruption to the flow of the ride.
iii. Start weights (within approx.. 8 hrs. of start)
iv. Veterinary Check Point weights (specific sites to be determined with consultation with ride management and veterinarians). Ideally, we would have at least 3 vet check weigh stations.
v. Finish
vi. 12-24 hours after finish
vii. Departure weights
viii. Home stable weights.

g. Logistics of weighing horses at the Tevis venue:

i. We have found very few (often none) horse refuse to be weighed, and our average weigh-time is less than 2 min/horse.

ii. We will measure and record ambient temperature and humidity at the weigh points every 15 minutes beginning at the start of the ride and until the last horse has finished.

iii. We will use two large animal, platform electronic-readout scales (Scale A & Scale B). The scales will be calibrated using the following procedure: a. adjust the internal calibration and check the tare weight; b. determine the individual weight of 5 volunteers using a medical scale; c. the medical scale shall have been previously calibrated using certified weights of 10 and 50 lbs; d. immediately after determining the volunteers weights, we will check the calibration of each large animal scale by measuring the sequential weights of the persons; 1-person, 2 persons, 3 persons, 4 persons and 5 persons previously weighed on the medical scale. The scales will be checked for calibration prior to weighing each horse, throughout the study, using known reference weights. We will repeat the full calibration as needed throughout the study. We will also check accuracy of the scales against none calibration weights certified by Mendocino Department of Agriculture – Weights and Measures.

Figure 1. Horse being weighed at the Virginia City 100.

iv. We have efficient means of loading, moving and unloading scales at the ride site, i.e., we can move scales quickly from one site to the next, with very little set up time at each site.

Figure 2. Research Volunteers at the 2017 Virginia City 100 Ride.

Figure 3. Volunteers unloading scale at weigh site at the 2016 Cooley Ranch Ride.

Figure 4. Transport vehicle and trailer for moving large animal scales at endurance rides.

It is important to plan the logistics of the scale movement with Ride Management, which is essential to the success of the study.

v. **Control veterinary data** will be collected for all horses in the competition and analyzed. This data will correlated with each horse's BW and speed of travel for each loop for each horse.

h. Data collection and analysis (Data points planned are listed as in Attachment-1, at the end of the proposal):

i. Training ride volunteers; prior to the start of the study and periodically during the course of the ride, we will have principals of the study train each volunteer. The aim is to have every volunteer understand the propose of the study and very specifically, their role in the study.

ii. The horse body weights will be measured and recorded by two trained technicians working at each of the two scale sites throughout the study.

iii. Trained volunteers will do timing of segments of the event. There will be two volunteers at each timing site; one will note the time for each horse and one will record the timing data.

iv. Veterinary exam data will be recorded by a trained scribe assigned to each veterinarian as dictated by the control veterinarian at each veterinary checkpoint. This will include any diagnostic and treatment data that may occur for any of the horses during the ride.

v. Statistical analysis and statistical correlations will be done by the PI using online statistical programs and as necessary with statistical consultants.

V. Animal Involvement Justification: We have designed this study to be non-invasive for the horses participating in the 2019 Tevis Ride. The only measures not usually collected at sanctioned endurance rides, will be the weighing of horses before, periodically at veterinary checkpoints during the ride, and after the completion of the ride. Our experience and that of several other investigators is that this is an extremely safe procedure and a normal husbandry practice at many equestrian stables. At least two weeks before the scheduled ride and in collaboration with Tevis Management, we are notifying all entered riders in the 2018 Tevis Ride of our intention to conduct the study.

VI. IACUC Approval (from the guidelines of the University of California, San Diego): Submitted by the Principal Investigator, Jerry R. Gillespie, DVM, PhD.

1. Jerry Gillespie, DVM, PhD., Principal Investigator, has had experience as a research Principal Investigator at the University of California, Davis and Kansas State University, and is familiar with the PHS Policy, USDA Regulations and UC-Davis policies for the care and use of animals, the provisions of the ILAR Guide to the Care and Use of Laboratory Animals, and all other federal, state, and local laws and regulations governing the use of animals in research. I agree to abide by all of these policies in the conduct of this investigation.

2. The Principal and Co-Principal Investigator are experienced equine veterinarians who are also experienced in doing humane research on horses. As Principal Investigator, I understand that emergency veterinary care will be administered to animals showing evidence of pain or illness, in addition to routine veterinary care as prescribed for individual species. I understand that it is my responsibility to provide current and updated emergency contact information for personnel who must be contacted in an animal emergency. I understand that any unanticipated pain or distress must be reported to the veterinarian or his/her designee. There will be a team of veterinarians on the ride site where this research will be conducted, who are responsible to assure the wellbeing of all horses in the ride.
3. The Principal Investigator is a diplomat in the American College of Veterinary Anesthesiologist, and as PI assures that I have reviewed carefully all procedures involved in this study and additionally I have consulted a group of veterinarians in the preparation of this proposal. There is NO anticipated pain for the horses due to the research proposed in this study.
4. As PI, I declare that all experiments involving live animals will be performed under my supervision or that of another qualified biomedical scientist listed on this protocol.
5. As PI, I certify that NO painful procedures are planned in conjunction with this investigation, and NO anesthetic procedures are planned as part of this research.
6. As the overseer of this research, I certify that I have attended the Mandatory Orientation to Research at the UC-Davis and Kansas State University.
7. I understand that the use of hazardous agents in animals may only be initiated after approval from EH&S.
8. I certify that all personnel on this protocol will be made aware of the hazards involving the use of live animals and tissues.
9. I understand that I must submit an amendment for any proposed changes to this protocol and wait for IACUC approval before beginning the work.
10. I understand that should I use the project described in this application as a basis for a proposal for funding (either extramural or intramural), it is my responsibility to ensure that the description of animal use in such funding proposals are identical in principle to that contained in this application.
11. I understand it is the responsibility of the Principal Investigator to ensure the safe and ethical conduct of all research conducted under this protocol, and to assure that all research is carried out following federal, state, and local policies governing animal research.
12. I certify that I will maintain complete, up-to-date and accessible records of procedures on animals as required by policy and regulation.
13. I declare that the information provided in the accompanying protocol is accurate to the best of my knowledge.

VII. Recombinant DNA/Biohazards (no page limit): NONE

VIII. Facilities and Equipment (one-page limit): The research group has a tested electronic, large animal scale, and a trailer to move the trailer from one race site to another or to sites within a ride. We are requesting funds for a second scale, necessary for the conduct of this study. Both scales will be available for future AERC studies.

X. Proposed Budget:

Budget for 2019 Tevis Dehydration Study

PERSONNEL:

Aki Tanaka – Scientific & Statistical consultation:		
5 hours @ $600/hr.	$3,000	
Jerry Gillespie - Principal Investigator:		
150 hours @ $600/hr. ($90,000)		- NC –
Martha Gillespie – Investigator:		
100 hours @ $400/hr. ($40,000)		- NC –
Subtotal Personnel		$3,000

EQUIPMENT AND SUPPLIES:

Scale back-up and Replacement parts for Trancell scale and for Optima scale;		
Rechargeable batteries (one) for Readouts	$ 50	
Readout wiring to scale (one for each readout, @ $50 ea.)	$ 100	
Backup force plates-(two@$300 ea.)	$ 600	
Recording supplies (secretarial supplies)		$ 500
Hay bales for scale borders		$ 400
Miscellaneous supplies (small tools, lubricants, etc.)	$ 100	
Trailer and generator maintenance		$ 100
Subtotal Equipment and Supplies		$1,850

TRAVEL AND VOLUNTEER SUPPORT:

Scale transport	$ 300	
Volunteer per diem expenses (10 volunteers)		$1,000
Volunteer T-shirts		$ 300
Subtotal Travel and Volunteer support		$1,600
GRAND TOTAL		**$6,450**

Proposed Budget Request:

AERC Research Fund	**$ 4,000**
Tevis Foundation	**$ 2,450**

TOTAL	**$ 6,450**

BUDGET JUSTIFICATION:

PERSONEL:

The Principal Investigator and Co-Investigator will donate their time to the project. The Statistician will charge the minimum consultation fee required by the University of California, Davis ($600/hr.). She estimates 5 hours work required to do the statistics on the data from the proposed study.

EQUIPMENT AND SUPPLIES:

We are requesting funds for the maintenance of the scale-transporting equipment and the two scales. We are requesting purchase fund for supplies/parts for the scales, which have proven to be vulnerable to wear and breakdown during studies. It is important to have these back-up parts on hand to quickly repair scales so there is no disruption of the study because of equipment failure.

The investigators are donating the cost of maintenance and operation of the transport vehicles for the two scales.

TRAVEL AND VOLUNTEER SUPPORT:

The supplies for recording data are essential to the study.

The investigators are donating the computers and computer/printer supplies required by the study.

It is important that the Research Volunteers be easily identified with "research T-shirts" during the study. We are requesting funds for the purchase of unique t-shirts.

Volunteers are donating most of their expenses to the project. We are requesting $100/ volunteer for their expenses during the 4-day (Thursday through Sunday) research project to help offset their costs for food, lodging and transportation.

If the proposed funding streams are not approved by AERC and/or Tevis, or if these organizations do not agree to fund the research in some fashion in full amount requested, The Principal Investigator reserves the right to withdraw from conducting the proposed research at the 2018 Tevis.

XI. BUDGET JUSTIFICATION:

PERSONNEL COSTS: The core research group are volunteers. The Investigators are giving their time and personal expenses related to the year-long research effort at no cost to the Project. The on site volunteers are providing their time and most of their expenses in support of the project. The only costs are those of the fee required by the statistical consultant. She has no choice as a member of the University of California, Davis , faculty but to charge a standard fee for her services to the Project.

SUPPLIES & EQUIPMENT: The equipment required for the project is on hand and in good repair. It is being provided by the Investigator and the AERC Research Committee. Our experience is that there will be some needed repair during the conduct of the Project, and we will attempt to anticipate these repairs by having needed parts on hand for the scales and transport equipment. The hay bales are required to line the edges of the two scales to assure safety of the horses during weighing.

OTHER: These expenses are to support the approximately 30 volunteers who will be assisting in the Project for a total of four consecutive days.

XII. SOURCE OF FUNDS: The Principal Investigator is taking responsibility for raising funds for the project. Potential sources of funds:

Western States Endurance Ride Foundation----$2,450
AERC Research Fund----------$4,000

The Principal Investigators are donating all of their time an personal expenses associated with the 2019 Tevis Dehydration Research

XIII. Cited References:

A. Transportation dehydration:

1. Friend TH. Dehydration, stress, and water consumption of horses during long-distance commercial transport. *J. Anim. Sci*. 2000; 78: 2568-2580.
2. Friend, TH, Martin, TM, Householder, DD, and Bushong, DM. Stress responses of horses during a long period of transport in a commercial truck. *J. Am. Med. Assoc*. 1998; 212:838 – 844.
3. Foss, MA. And Lindner, A. Effects of trailer transport duration on body weight and blood biochemical variables of horses. *Pferdeheikunde.* 1996;12:435-437.
4. Mars, LA. Kiesling, HE. Ross, TT. Armstrong, JB. And Murray, L. Water acceptance and intake in horses under shipping stress. *J. Eq. Vet. Sci.* 1992;12:17-20.

B. Dehydration (weight loss) during endurance competitions:

5. Andrews, FM, Ralston, SL. Sommardahl, CS. Maykuth, PL. Green, EM. White, SL. Williamson, LH. Holmes, CA. and Geiser, DR. Weight, water, and cation losses in horses competing in a three-day event. *J. Am. Vet. Med. Assoc. 1994;*205:721-724.
6. Barton, MH. Williamson, L. Jacks, S. and Norton, N. Body weight, hematologic findings and serum and plasma biochemical findings of horses competing in a 48-, 83- or 159 km endurance ride under similar terrain and weather conditions. *Am. J. Vet. Res.* 2003;64:746-753.
7. Carlson, GP. Thermoregulation and fluid balance in the exercising horse. In Snow DH, Persson, SGB. Rose, RJ.(Eds.)*: Equine Exercise Physiology.* Cambridge, Granta Editions, 1983;291.
8. Carlson, GP. Haematology and body fluids in the equine athlete: A review, In:*Equine Exercise Physiology,* Eds. J.R. Gillespie and N.E. Robinson, ICEEP Publications, Davis, California*.* 1985;393-425.
9. Eker, GL. And Lindinger, MI. Efects of terrain, speed temperature and distance on water and ion losses. *Equine Vet. J. Suppl.* 1995;*18:298-305.*
10. Hodgson, DR. McCutchen, LJ. Byrd, SK. et al. Dissipation of metabolic heat in the horse during exercise. *J. Appl. Physiol.1993;74:1161.*
11. Lawrence, L. Jackson, S. Kline, K. Moser, L. Powell, D. and Biel, M. Observations on body weight and condition of horses in a 150 mile endurance ride. *J. Equine Vet. Sci.* 1992; 12:320-324.
12. Sampieri, F. Schott, HC. Hinchcliff, KW. Geor, RJ. And Jose-Cunilleras, E. Effects of sodium chloride and potassium chloride supplementation on endurance horses competing in 80-km rides. *Equine Vet. J. Suppl.* 2006*; 36:19-26.*
13. Schott, HC, McGlade, KS, Molander, HA, Leroux, AJ and Hines, MT. Body weight, fluid, electrolyte and hormonal changes in horses competing in 50- and 100-mile endurance rides. *Am J. vet. Res*. 1997;58:303-309.
14. Schott, HC. Marlin, DJ. Geor, RJ. Holbrook, RC. Deaton, CM. Vincent, T. Dacre, K. Schroter, RC, Jose-Cunilleras, D. and Cornelisse, CJ. Changes in selected physiological and laboratory measurements in elite horses competing in a 160 km endurance ride. *Equine Vet. J., Suppl.* 2006;36:37-42.
15. Schott, HC. Challenges of Endurance Exercise: Hydration and electrolyte depletion. *17th Proc Kentucky Equine Research Nutrition Conference, Feeding and Veterinary Management of the Sport Horse,* Lexington, KY. 2010;94-111.

C. **Dehydration metabolic diseases:**

16. Carlson, GP. Medical problems associated with protracted heat and work stress in horses. *Compend. Contin. Educ Pract. Vet. 1985;* 7: (suppl);S542.

17. Carlson, GP. Ocen, PO. and Harrold, D. Clinicopathologic alterations in normal and exhausted endurance horses. *Teriogeno*. 6: 1976;6:93-104.
18. Fowler, ME. The exhausted horse syndrome. *In Proc. 25th Annu. Meet. Am. Assoc. Equine Pract.* 1979:25:479-482.
19. Sosa Leon, A. Davie, AJ. Hodgson, DR, Evans, DL, and Rose, RJ. Effects of oral fluid and cardiorespiratory and metabolic responses to prolonged exercise. *Equine Vet J. Suppl.* 18: 1995; 274-278.
20. Geor, RJ and McCutcheon, LJ. Thermoregulation and clinical disorders associated with exercise and heat stress. *Comp. Cont. Educ. Pract. Vet.* 1996;18:4336-444.
21. Geor, RJ. And McCutcheon, LJ. Hydration effects on physiological strain of horses during exercise-heat stress. *J. Appl. Physiol*. 1998;84:2042-2051.
22. Foreman, JH. The exhausted horse syndrome. *Vet. Clin. N. Am.: Equine Pract.* 1998;14:205-219.
23. Fielding, CL. Magdesian, G. Rhodes, DM. Meier, CA. and Higgins, JC. Clinical and biochemical abnormalities in endurance horses eliminated from competition for medical complications and requiring emergency medical treatment: 30 cases (2005- 2006). *J. Vet. Emergency and Critical Care.*2009:19:473-478.
24. Flaminio, MJ. Rush, BR. Fluid and electrolyte balance in endurance horses. *Vet Clinics of North America: Equine Practice.* 1998.14:147-159.
25. Persson S. On blood volume and working capacity in horses. *Acta Vet Scand Suppl*. 1976; 19:1.

D. Tolerance of horses to dehydration and Other:

26. Meyer, H. and Coenen, M. Influence of exercise on the water and electrolyte content of the alimentary tract. *In Proc. 11th Equine Nutr. Physiol. Symp.* 1989;11:3-7.
27. Gillespie, JR. Kerr, J. Adamson, B. and Ellery, J. Adding to Our Understanding of Cardiac Recovery Index at Endurance Rides. *Endurance News.* 2015. August.

XIV. Prior AERC Support during the last three years: $16,000

XV. Biographical Data:

A. Principal Investigator:

1. **Jerry R. Gillespie, DVM, PhD.**
2. **Role in project:** Oversee project and be involved in all aspects of planning and conducting the study. Will be responsible for analyzing the data and overseeing publication of results.

3. **Current position:** UCD professor, RETIRED (2007), Chair of AERC Research Committee
4. **Degrees:** BS & DVM, Oklahoma State University: PhD, University of California – Davis.
5. **Previous positions:**

2002 – 2007	Director, Western Institute for Food Safety and Security, University of California, Davis
2000-2002	Executive Director, Joint Institute for Food Safety Research, Departments of Agriculture and Health and Human Services, Washington, D.C.
1994-2000	Director, Food Animal Health and Management Center, College of Veterinary Medicine, Kansas State University, Manhattan, KS
1985-1994	Professor and Head, Department of Clinical Sciences, College of Veterinary Medicine, Kansas State University, Manhattan, KS
1985-1994	Head of KSU-Veterinary Medical Teaching Hospital, College of Veterinary Medicine, Kansas State University, Manhattan, KS
1976-1985	Professor of Physiology, Department of Physiological Sciences, School of Veterinary Medicine and Human Physiology, School of Medicine, University of California, Davis, CA
1971-1973	Associate Dean of Student Services, School of Veterinary Medicine, University of California, Davis, CA
1971-1973	Associate Professor and Co-Chairman of Physiological Sciences, School of Veterinary Medicine, University of California, Davis, CA
1969-1976	Associate Professor of Physiology, Department of Physiological Sciences, School of Veterinary Medicine and Human Physiology, School of Medicine, University of California, Davis, CA
1968-1969	Associate Professor of Clinical Sciences, School of Veterinary Medicine, University of California, Davis, CA
1966-1968	Assistant Professor of Clinical Sciences, School of Veterinary Medicine, University of California, Davis, CA

Sabbatical Leaves

1980-1981	Sabbatical Leave, Laboratoire de Physiologie Respiratoire, Centre National de la Recherche Scientifique, Strasbourg, France
1973-1974	Sabbatical Leave, Department of Physiology, Harvard School of Public Health, Boston, MA

Post-Doctoral Appointments

1998.	Agribusiness Seminar, Graduate School of Business Administration, Harvard University, January 1998
1989.	Management Development Program, Harvard University, Cambridge, MA [Served on Advisory Board for Program (1989-1994)].
1966.	Post-doctoral Research Fellow, Cardiovascular Research Institute, University of California Medical Center, San Francisco, CA
1965.	Assistant Specialist, Department of Anatomy, University of California, Davis, CA

Veterinary Practice

1961-1962 General Veterinary Practice, Gothenburg Animal Hospital, Gothenburg, Nebraska

6. Major appointment and honors (partial list):

2002	Outstanding Alumni Achievement Award, School of Veterinary Medicine, University of California, Davis
2002	Special Service Citation – Secretary US Department of Health and Humane Services
2002	Special Service Citation-Commissioner of Food and Drug Administration
2001	Chair of the National Academies of Practice – Veterinary Medicine
2001	Member of Administrative Council – National Academies of Practice
1996	Selected as the recipient of the Faculty Achievement Award from the American Association of Veterinary Clinicians
1992-2002	Chair of Federation Equestre Internationale (FEI) Endurance Committee (six member international committee)

1992-2002	United States Equestrian Team, Committee on Endurance Competition
1992-2002	American Horse Show Association, Inc. Endurance Committee (The National Equestrian Federation of the United States)
1992-2002	Elected as Distinguished Practitioner in the National Academies of Practice in Veterinary Medicine
1996.	Chair, Planning Committee – FEI World Championship Endurance Ride, Kansas, USA.
1989-2002	Editor-in-Chief, The Equine Athlete
1989.	Harvard Management Development Program, Cambridge, MA. Elected Class Representative and Member of Alumni Board.
1988-2002	Harry M. Zweig Memorial Fund, Equine Research Committee, Cornell University, Ithaca, NY
1988 – 2002	Member Board of Directors, American Horse Shows Association (renamed USA Equestrian Federation, 2001)
1987-2002	Federation Equestre Internationale (FEI), International Certified Judge and Veterinarian
1990.	Life Sciences Committee, Council for International Exchange of Scholars, Washington, D.C.
1989.	American Endurance Ride Conference Liaison Officer for American Association of Equine Practitioners
1985.	President, Association for Equine Sports Medicine
1984-85	President, Comparative Respiratory Society
1982-2002	Member, International Committee for the International Conference on Equine Exercise Physiology
88.	Chairman, American Association of Equine Practitioner's Committee on Equine Sports Medicine

87. Chairman, National Planning Committee for the 2nd International Conference on Equine Exercise Physiology, San Diego, CA 1986

83. President-elect and Program Chairman, Comparative Respiratory Society

83. Chairman, Association for Equine Sports Medicine

1982. West German National Equestrian Federation Outstanding Leadership Award 1982 in acknowledgment for contributions to the sport of equine endurance riding

1980-81 Receipt of a Fulbright-Hayes Award

81. National Institutes of Health - Senior International Fellow

82. Representative Councilor, American Thoracic Society

7. Selected peer-reviewed publications:

1998. Rush, B.L., E.S. Raub, W.S Rhoads, J.B.F. Flaminio, C.J. Matson, J.E. Hakala, J.R. Gillespie. Pulmonary Function in Horses with Recurrent Airway Obstruction After Aerosol and Parenteral Administration of Beclomethasone Dipropionate and Dexamethasone, Respectively. *American Journal of Veterinary Research* 59(8): 1039-1043, 1998

1989 Wagner, P.D., J.R. Gillespie, G.L. Landgren, M.R. Fedde, B.W. Jones, R.M. DeBowes, R.L. Pieschl and H.H. Erickson. Mechanism of Exercise-Induced Hypoxemia in the Horse. *Journal of Applied Physiology* 66(3):1227-1233, 1989

1989 Dunlop, C.I., D.S. Hodgson, J.W. Watson, J.R. Gillespie, E.P. Steffey and A.C. Jackson. High frequency jet ventilation in horses: an experimental study. *Equine Veterinary Journal* (1989) 21(5)342-346

1988 Landgren, G.L. and J.R. Gillespie. How Horses Breathe During High-Speed Galloping, 35th Annual Convention Proceedings, American Association of Equine Practitioners, Boston, MA, 1989:381-384

1988 Gillespie, J.R. The Respiratory System: Function and Functional Limits of the Equine Athlete. *Proceedings of the Thirty-Third Annual Convention of the AAEP*, New Orleans, LA, 1987:251-260

1987 Landgren, G.L., J.R. Gillespie, M.R. Fedde, B.W. Jones, P.L. Pieschl and P.D. Wagner. O_2 Transport in the Horse During Rest and Exercise. Edited by Norberto C. Gonzalez and M. Roger Fedde. Plenum Publishing Corporation

1975 Gillespie, J.R. Postnatal lung growth and function in the foal. *Journal of Reproduction and Fertility, Supplement 23*

1974 Gillespie, J.R. The role of the respiratory system during exertion. *Journal of the South African Veterinary Association* 45(4):305-309

1973 Steffey, E.P. and J.R. Gillespie. Respiration and general anesthesia. *Veterinary Clinics of North America* 3(1):45-56

1973 Cross, C.E., H. Gong, Jr., C.J. Kurpershoek, J.R. Gillespie and R.W. Hyde. Alterations in distribution of blood flow to the lung's diffusion surfaces during exercise. *Journal of Clinical Investigation* 52:414-421

1972 Nowell, J.A., J.R. Gillespie and W.S. Tyler. Scanning electron microscopy of chronic pulmonary emphysema: A study of the equine model. Proceedings of the 4th Annual Scanning Electron Microscope Symposium 297-304, IIT Research Institute, Chicago, IL. *Journal of the American Veterinary Medical Association* 16(1):57-60

1971 Tyler, W.S., J.R. Gillespie and J.A. Nowell. Modern functional morphology of the equine lung. *Equine Veterinary Journal* 3:84-94

1969 Gillespie, J.R., W.S. Tyler and L.W. Hall. Cardiopulmonary dysfunction in anesthetized, laterally recumbent horses. *American Journal of Veterinary Research* 30(1):61-72

1968 Eberly, V.E., J.R. Gillespie, W.S. Tyler and M.E. Fowler. Cardiovascular values in the horse during halothane anesthesia. *American Journal of Veterinary Research* 29:305-314

1968 Burgess, J.H., J.R. Gillespie, P.D. Graf and J.A. Nadal. Effect of pulmonary vascular pressures on single-breath CO diffusing capacity in dogs. *Journal of Applied Physiology* 24:692-696

1968 Gillespie, J.R. Large animal restraint and surgical chute. *Journal of the American Veterinary Medical Association* 152:634-637

1968 Hall, L.W., J.R. Gillespie and W.S. Tyler. Alveolar-arterial oxygen tension differences in anesthetized horses. *British Journal of Anaesthesia* 40:560-568

1967 Gillespie, J.R. and W.S. Tyler. Quantitative electron microscopy of the interalveolar septa of the horse lung. *American Review of Resp. Disease* 95:477-483

1967 Gillespie, J.R. and W.S. Tyler. Capillary and cellular changes in the alveolar walls of emphysematous horse lungs. *American Review of Resp. Disease* 95:484-490

1966 Gillespie, J.R., W.S. Tyler and V.E. Eberly. Pulmonary ventilation and resistance in emphysematous and control horses. *Journal of Applied Physiology* 21:416-422

1966 Eberly, V.E., W.S. Tyler and J.R. Gillespie. Cardiovascular parameters in emphysematous and control horses. *Journal of Applied Physiology* 21:883-889

1966 Gillespie, J.R. Factors affecting the pulmonary mechanics of the normal and emphysematous horse. Proceedings, Symposium on Acute Bovine Pulmonary Emphysema, University of Wyoming, Laramie, WY

1964 Gillespie, J.R., W.S. Tyler and V.E. Eberly. Blood pH_2 and CO_2 tensions in exercised, control and emphysematous horses. *American Journal of Physiology* 207:1067-1072

1964 Eberly, V.E., J.R. Gillespie and W.S. Tyler. Cardiovascular parameters in the Thoroughbred horse. *American Journal of Veterinary Research* 25:1712-1716

2. Books and Chapters:

1996 Flaminio, J.B.F., Gaughan, E.M., Gillespie, J.R. Exercise Intolerance in Endurance Horses. The Vet Clin North Am: Equine Practice. Vol. 12, No. 3, pg 565-580.

1992 Gillespie, J.R. The Respiratory System: Function and Functional Limits of the Equine Athlete, Volume II, pp 281-291. In: Proceedings of the 9th International Conference of Racing Analysts and Veterinarians, New Orleans, LA

1992 Gillespie, J.R. For the Equine Athlete, Running and Breathing are not Trivial Matters, pp 1-6. In: Proceedings of the Focus on Endurance '93, Equine Research Centre, University of Guelph, Guelph, Ontario, Canada

1991 Landgren, G.L., J.R. Gillespie and D.E. Leith. No Ventilatory Response to CO_2 in Thoroughbreds Galloping at 14 m s^{-1}. In: Equine Exercise Physiology 3. S.G.B. Persson, A. Lindholm and L.B. Jeffcott (Eds.) ICEEP Publications, Uppsala, Sweden

1991 Beaunoyer, D.E., S.G. Jackson, J.R. Gillespie and J.P. Baker. The Effect of Monosodium Glutemate Infusion on Time to Fatigue. In: Equine Exercise Physiology 3. S.G.B. Persson, A. Lindholm and L.B. Jeffcott (Eds.) ICEEP Publications, Uppsala, Sweden

1991 Gillespie, J.R., G.L. Landgren and D.E. Leith. 1:2 Ratio of Breathing to Stride Frequencies in a Galloping Horse Breathing 6% CO_2. In: Equine Exercise Physiology 3. S.G.B. Persson, A. Lindholm and L.B. Jeffcott (Eds.) ICEEP Publications, Uppsala, Sweden

1987 Dahl, L-G., J.R. Gillespie, P. Kallings, S.G.B. Persson and J.R. Thornton. Effects of a cold environment on exercise tolerance in the horse. A review. Chapter in Equine Exercise Physiology 2, J.R. Gillespie and N.E. Robinson (Eds.) ICEEP Publications, Davis, CA

1987 Gillespie, J.R., N.E. Robinson, Editors, Equine Exercise Physiology 2, ICEEP Publications, Davis, CA

1984 Gillespie, J.R. and T.C. Amis. Respiratory physiology of the surgical patient. Chapter in The Practice of Large Animal Surgery. W.B. Saunders, Philadelphia, PA, Vol 1:356

1983 Gillespie, J.R. and J.R. Pascoe. Respiratory function in the exercising horse: A review. Chapter in Equine Exercise Physiology, D.H. Snow, S.G.B. Persson and R.J. Rose (Eds.) Granta Editions, Cambridge, England

1980 Gillespie, J.R., J.D. Berry, L.L. White and P. Lindsay. Effects on pulmonary function of low-level nitrogen dioxide exposure. Chapter 15, pp. 231-242. Ann Arbor, MI

1980 Gillespie, J.R. Control of breathing. Scientific Foundations of Veterinary Medicine, Section III: Metabolism. Heinemann Medical Books Limited.

1976 Gillespie, J.R. Pulmonary physiology, 4 chapters (13. Introduction to respiration, 14. Internal respiration, 15. External Respiration, 16. Control of ventilation), pp. 335-398. In: Veterinary Physiology, J.W. Phillis (Ed.), Scientechnica, Bristol, England

1976 Gillespie, J.R. Pathophysiologic classification and a diagnostic system for respiratory diseases, p. 266-267. In: 1976 Scientific Proceedings, Anaheim, CA. May 16-21, 1976

1976 Wilson, A.F., R.D. Fairshter, J.R. Gillespie and J. Hackney. Evaluation of abnormal lung function. Annual Review of Pharmacology and Toxicology 16:465-486, H.W. Elliott (Editor)

1975 Robinson, N.E. and J.R. Gillespie. Physiology of the respiratory system, Chapter 17, 2:527-543, In: Textbook of Veterinary Internal Medicine; Diseases of the Dog and Cat, S.J. Ettinger (Ed.)

1975 A Review of hematologic response to exercise, Exercise, pp. 435-443. In: Proceedings First International Symposium on Equine Hematology, May 28-30, 1975, American Association of Equine Practitioners

1975 Gillespie, J.R., A. Kaufman, J. Steere and L. White. Arterial blood gases and pH during long distance running in the horse, Exercise, pp.450-468. In: Proceedings First International Symposium on Equine Hematology, May 28-30, 1975, American Association of Equine Practitioners

1975 Gillespie, J.R., O.W. Schalm and W.S. Tyler. Hematologic response of the horse to general anesthesia: A review and new date, General Anesthesia, pp.490-496. In: Proceedings First International Symposium on Equine Hematology, May 28-30, 1975, American Association of Equine Practitioners

1974 Gillespie, J.R. and W.S. Tyler. Chronic obstructive lung disease in horses, pp. 223-227. In: Research Animals in Medicine. L. Harmison, (Ed.)

1973 Gillespie, J.R. Heaves. Chapter in Merck Veterinary Manual, Merck & Co., Inc., Rahway, NJ, pp.889-890

1971 Gillespie, J.R. and N.E. Robinson. Clinical respiratory physiology, p. 165-173. In: E. Kirk and W.B. Saunders, (Eds.), Current Veterinary Therapy, Philadelphia (revised 1974)

1969 Gillespie, J.R., and W.S. Tyler. Chronic alveolar emphysema in the horse. In: Advances in Veterinary Science, Academic Press, Inc., New York and London 13:59-100

1969 Tyler, W.S. and J.R. Gillespie. Structural and functional alterations in horses with emphysema, p.38-51. In: Animal Models for Biomedical Research, Publication 1736, National Academy of Sciences

1965 Gillespie, J.R. The effect of enlarged airspaces on the function and structure of horse lungs. Ph.D. Thesis in Comparative Pathology

2003 – 2006	Associate, Michael S. Peralez, DVM & Associates, Arcadia, California
2006 – 2007	Associate, All Creatures Animal Hospital, Montclair, California
2007 - 2015	Chief of Staff, All Creatures Animal Hospital, Montclair, California
2004 -2012	Adjunct Professor (*ad hoc* appointment), Department of Animal & Veterinary Sciences, California State Polytechnic University, Pomona, California.
1999-2002	Adjunct Professor (*ad hoc* appointment) College of Veterinary Medicine & Biomedical Sciences, Colorado State University, Fort Collins, Colorado.