The pregnant mares’ urine industry—management and research

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Pregnant mares’ urine (PMU) racing is a cooperative effort between equine agriculture and human medicine and is an important part of the equine industry. The ranches are located in North Dakota and the 3 prairie provinces of Canada (Manitoba, Saskatchewan, and Alberta). There are currently 631 ranches that contract to provide PMU, and approximately 35,000 mares are involved in its production. Additional horses kept on these ranches include stallions, young stock, and other mares. Pregnant mares’ urine racing is an important part of the agricultural economy and community in these regions.

The presence of multiple estrous conjugates during pregnancy and excrete these conjugates in the urine. Multiple estrone is extracted from PMU to manufacture a hormone replacement for postmenopausal women. Although this presentation focuses only on the management and welfare of pregnant mares, it is important to understand that manufacturing this hormone replacement is of major importance to women’s health care.

The Industry

On the basis of an industry demographic survey, the typical PMU rancher has worked in PMU racing for more than 10 years; works the ranch with a spouse, child, and 1 hired hand; is the second generation of their family to work the family ranch; and cares for approximately 75 to 80 pregnant mares; breeds more mares than any other registered breed and also produces cereal grains, forages, and other livestock.

Pregnant mares’ urine racing follows a regular annual cycle. Mares are stabled while they produce estrone conjugates during harsh winter weather. This means they are stabled beginning in October and return outdoors in March. Foaling takes place outdoors. During spring and summer, mares are maintained in hand on pasture. Most ranches use a natural pasture breeding management program. Stallions are turned out with mare bands between June 1 and August 1. Foals are weaned in the fall when they are a minimum of 3 months old.

Urine is collected by use of a noninvasive lightweight collection unit suspended by elastic tubing from the ceiling behind the mare. During urine collection season (October to March) mares are housed in tie-stall barns. The collection cup is maintained near the perineum of the mare and will catch urine during normal urination. Collection of urine reduces wet bedding and, consequently, barn odor and ammonia. The suspension design allows stable mares to move around and lie down freely within the stalls. Mares are periodically turned out to paddocks for free exercise. Farrow schedules vary among ranches.

Independent ranchers contract to supply PMU to Wyeth-Ayerst Global Pharmaceuticals. This contract includes an obligation to supply guidelines in the Recommended Code of Practice for the Care and Handling of Horses in PMU Operations (The Code). These comprehensive standards developed by a committee, which included independent veterinarians and government personnel, are being used by industry inspectors who evaluate each ranch monthly. The Code has been appended to the new Canadian-wide code for horses, which was coordinated by the Canadian Agri-Food Research Council (CARC), CARC Canada Committee on Animals, CARC Expert Committee on Farm Animal Welfare and Behavior, and the Canadian Federation of Humane Societies.

Continuous Improvement Program

The Continuous Improvement Program (CIP) encompasses various steps developed by veterinarians, quality assurance specialists, and other members of the PMU industry. These steps are designed to ensure the health and well-being of the horses involved, identify any problems within the industry, and develop ongoing strategies to improve mare and ranch management. It is, in essence, an industry-wide herd health program. The following are components of the CIP:

- Monthly returns to farms—PMU industry employs field representatives who conduct monthly comprehensive ranch reviews. An extensive review form was developed to facilitate complete and consistent inspections.
- Data is entered into a computerized database. To evaluate findings, interview form is reviewed, archived, and searched by quality assurance specialists based on demographic data, month, or inspection results. Ranchers and field inspectors develop solutions to any problems identified, and the results are monitored by repeat assessments and data collection. Field supervisors also review ranches and the ranch inspection process.

Veterinary review program—Ranches are obligated to hire an independent practicing veterinarian to conduct 3 complete herd health reviews while mares are stabled in November, January, and March. A herd health report is submitted, and a committee of veterinarians to facilitate reviews and ensure they are complete and consistent. Herd health forms are also reviewed by the industry veterinarian in charge of PMU mare health. More than 90 veterinarians participate in conducting these herd health assessments.

Independent ranch review—Several national, provincial, and state offices have the authority to inspect ranches and investigate complaints. These include the Veterinary Services Branch of Manitoba Agriculture, the Saskatchewan SPCA, the Alberta SPCA, and the North Dakota Board of Animal Health. In addition, various equine experts have conducted ranch reviews. A recent extensive outside ranch review was conducted during the 1996 to 1997 collection season by international equine veterinarians representing the American Association of Equine Practitioners (AAEP), the Canadian Veterinary Medical Association (CVMA), and the International League for the Protection of Horses (ILPH). For this review, participating veterinarians selected ranches for inspection in all 3 provinces and North Dakota. The review encompassed 25 ranches and approximately 2,400 mares from which urine was currently being collected. Findings were published in a consensus report issued by the participating veterinarians.1 The veterinarians concluded, “Based on our inspections, the allegations of inhumane treatment of horses involved in PMU ranching are unfounded.”

Barn improvement program—A formal assessment of all barns collecting PMU for Wyeth-Ayerst Global Pharmaceuticals was conducted as a part of the CIP. Facilities that did not meet current technical or dimensional guidelines established in The Code were prioritized for renovation or replacement, even when horse care within those facilities was considered acceptable. Facility review and evaluation of horse management are a part of this ongoing program.

Linthorpe Equine Ranch—A working PMU ranch was purchased and developed as a research and educational facility. A veterinarian was hired to manage the facility, conduct research studies on mare management and welfare, and oversee all aspects of PMU and foaling across the industry. Veterinarians, clinicians, and researchers from outside the industry, collaborated on research studies conducted at Linthorpe Equine Ranch. In addition, the facility has been reviewed for accreditation by the Canadian Council on Animal Care.

Equine Management Group and Equine Advisory Board—The Equine Management Group comprises veterinarians, managers, and producers from around the United States and outside the industry. The group is charged with oversight and publication of research conducted at Linthorpe Equine Ranch, and Linthorpe Equine provides veterinary consulting on equine health and management. Members of the Equine Advisory Board are veterinarians and scientists who provide expertise on their area of concentration. Equine Management Group and Equine Advisory Board members have credentials in equine medicine, physiology, reproduction, nutrition, and behavior. Veterinarians in the Equine Management Group work in industry, academia, and state practice. All Advisory Board members currently practice in industry or academic settings. Participating academic institutions include Cornell University, Michigan State
University, The Ohio State University, The University of Pennsylvania New Bolton Center, Rutgers University, and the University of Massachusetts.

Current Research Initiatives in the PMU Industry

Many animal agriculture industries have conducted controlled research studies to evaluate established management practices in the face of changing perspectives on animal welfare. The PMU industry, in conjunction with the Equine Industry Management Group and Equine Advisory Board, has conducted controlled studies at Linwood Equine Ranch, evaluating methods of watering stabilized mares, turnover frequency, nutrition, and other barn management issues. Some data were presented at the 1998 AAP Annual Convention.14 Complete studies of watering methods were recently published in the American Journal of Veterinary Research.15 Current research may influence welfare, indicators of physiologic and psychologic well-being were emphasized in these summaries. Summaries of related projects follow.

Watering methods—Provision of water ad libitum to stalled mares results in substantial spillage and sec- ondary barn hygiene and management problems. Various methods for providing water intermittently have been developed to prevent these problems. These methods were critically compared to continuous water- ing and a new timer-controlled system designed to provide water only when mares are eating.16 Mares were evaluated for health and hydration status. Clinical and biochem- ically. To address psychologic well-being, detailed surveys, clinical observations, and direct observations of behavior were conducted. In all cases, mares were hydrated and healthy when given intermittent access to water. Behavior of mares was normal and free of stereotypic behaviors. These studies indicated that regular, intermittent access to water supports the physio- logic and psychologic well-being of mares.

Turnover frequency—Mares are housed during the winter months at Linwood Equine Ranch. A series of studies were undertaken at various intervals. No data is available from which to make recommendations regarding the appropriate frequency for turnover. However, there are several factors that indicate that placing pregnant mares will occasionally develop dependent or other forms of limb swelling. This limb swelling is not necessarily pathologic and is not always exercise-responsive. Studies were conducted at Linwood Equine Ranch to evaluate the physiologic and psychologic well-being of mares under various turnover frequencies. Although these studies are still in progress, results indicate that results of physiologic and health behavioral assessments do not differ among mares on daily, weekly, or biweekly turnover schedules.17 It is clear from clinical observation and research studies that the needs of individual mares vary, and management factors must be considered in establishing appropriate turnout schedules.

Issues Raised by Critics

Oversight of the industry and mare well-being— Currently, the PMU industry has an extensive review and oversight program. Inspections in the CIP provide a multilevel series of checks and balances during review of mare well-being. The veterinary director, field super- visor, private veterinarian herd health reviews, industry veterinarian oversight, outside reviews by equine experts, and regulatory agencies are required to complete a training program with the industry veterinary supervisor. Inspections occur biannually for 3 years.

Veterinary care on PMU ranches compares favor- ably to the norm for US housed-owned horses, based on the AVMA Center for Information Management 1997 report.18 Whereas all PMU ranches must conduct a veterinary herd health review at least 3 times per year, more than 40% of US household-owned horses did not receive a veterinary examination. Comparatively, the PMU industry is a highly regulated and closely monitored industry within an area where additional input by veterinarians can be useful to ranchers. Selling foals at auction or to feeders is likely to be the fate for PMU ranchers. As horse breeders, the ranchers’ association (North American Equine Research Council [NAERC]) has developed several programs to further increase the quality of foals produced and their mar- kets.19 These programs include a Breeding Enhancement Program designed to cross PMU mares with Thoroughbred stallions for the purpose of produc- ing quality North American horses for the sport horse industry. There are also financial incentive pro- grams for buyers of registered or unregistered PMU mares as registered purebreds, ranch horses, and draft horse breeds.

Urine collection system—Some members of the public believe that mares are periodically subjected to rectal collection by catheterization. In reality, the supervised-col- lection system is noninvasive, allows freedom of movement for stall, and veterinary turnover schedules vary between ranches and, in many cases, are based on the needs of individual mares. This study showed that aliquot data is of limited useful output, tie-stall management has long been practiced around the world. A lack of objective data exacerbates the use of subjective turnour requirements for pregnant mares, and critics have expressed concern regarding system in their urine nutrition research programs.

Impregnation—This is a term used by groups crit- ical of PMU collection; however, it does not accurately reflect the natural pasture breeding management on PMU ranches.

Education—Ranchers’ national and local associa- tions conduct meetings and produce publications as continuing education for ranchers. Recently, a veteri- nary continuing education conference was held for practitioners working in the PMU industry.

Conclusions

The purpose of this presentation was to provide information regarding equine management in the PMU industry and describe programs designed to address concerns about the care and well-being of mares involved in the production of PMU. The industry has been a proactive leader in responding to criticisms and addressing questions regarding mare management and well-being. Ranch inspection and veterinary review programs in place should identify and correct prob- lems that may arise. Mares are evaluated biannually collected to date, specifically behavioral assessments yielding normal results, indicate that PMU mares can be managed appropriately for their health and well- being. This perspective is supported by the concluding statement from the North American Equine Research Council’s Consensus Report. The public should be assured that the care and welfare of the horses involved in the PMU industry are monitored with the utmost care, and that all interventions and treatment for an internal or external medication is good, and is closely monitored.

References