

## WESTERN COORDINATING COMMITTEE PETITION

**NUMBER:** WCC-110

**TITLE:** Improving ruminant use of forages in sustainable production systems for the western U.S.

**DURATION:** 1 October 1999 to 30 September 2004

### **DESCRIPTION AND JUSTIFICATION:**

Animal agriculture in the western U.S. is dominated by cow-calf and ewe-lamb enterprises utilizing grazed or harvested forage resources. The landscape and climate of the West provides abundant rangelands and agricultural lands suited to forage production, but land suitable for production of other crops or feedstuffs is limited. The nutritional value of these forages, particularly those grazed from rangeland, is highly variable in space and time, with the nutrient content often below requirements of livestock. Despite significant accomplishments by animal and range scientists to understand these relationships and develop management strategies to overcome them, opportunities remain for improvement in the efficiency of conversion of grazed and harvested forages to animal products useful for human consumption. Increased knowledge in this field would contribute to improved nutritional status and productivity of livestock, improved economic efficiency in forage-based livestock production systems, and improved sustainability in ranching enterprises and rural communities that depend upon them. A multitude of issues challenge livestock producers throughout the West, but maintaining economic viability is the most important and most difficult to address because production costs often exceed market value of livestock and livestock products. Economic efficiency can be improved by increasing biological efficiency. Improving the proportion of forage nutrients converted to animal products based on sound, science-based management strategies is the most viable means of achieving improved biological efficiency. Efforts will be focused on improved biological efficiency, such as eliciting greater levels of targeted livestock response (i.e. growth, reproduction) per unit of forage consumed. In turn, effectiveness of these improvements in biological efficiency on economic efficiency, measured as change in returns per unit of additional input, will be monitored. Regional coordination will allow synergism in development of knowledge in each component area as well as integration into systems approaches.

Another major issue challenging producers is that forage-based production systems must enhance ecological sustainability of western rangelands. Production systems that optimize livestock efficiencies cannot do so at the expense of the environment. Systems that concomitantly improve livestock and landscape responses need to be used. For example, increased conversion of nutrients to productive purposes in the animal reduces nutrient loading in air, soil, and water through decreased animal excretion. Individual state efforts that contribute to this issue will be conducted collaboratively with range ecologists and watershed scientists within those institutions.

The focus of this WCC is to contribute to our basic understanding of processes in (1) the plant-animal-landscape interface, (2) nutrient digestion and utilization from forages, and (3) nutritional management strategies based on grazed or harvested forages. The intent is to improve livestock behavioral, digestive, metabolic, physiologic, production, and integrated system responses. Continuous communication and collaboration among scientists working in this discipline can lead to the most rapid development and transfer of new knowledge related to sustainable

livestock production from forage-based systems. This effort will contribute to the ESCOP initiative ranked number 2 by AES directors in the western region: “develop integrated and sustainable animal production systems.” It will indirectly contribute to other initiatives, such as strengthening rural economic development, converting processing by-products to beneficial uses (as feedstuffs), conserving and enhancing air, soil, and water resources (through reduced nutrient excretion and improved livestock grazing distribution), and enhancing the health and well-being of food animals (through improved nutritional status).

### **OBJECTIVES:**

1. To share results of recent research efforts, foster new research ideas, and coordinate future cooperative scientific efforts.
2. To facilitate the transfer of technology to livestock producers, extension personnel, and others in animal industries.
3. To promote implementation of improved management that will:
  - Optimize livestock responses and efficiencies in sustainable forage-based production systems.
  - Enhance or maintain ecological sustainability of forage-based livestock production systems.

### **EXPECTED OUTCOMES:**

1. Identification of critical/key research issues related to forage utilization by ruminants.
2. Development of specific research programs in priority areas on a regional basis that could lead to proposals for extramural funding.
3. Development of livestock management strategies that will improve biological and economic efficiency of forage-based livestock production and maintain or improve ecological sustainability. Improved economic efficiency can result from reduced feed costs, improved livestock performance, or improved livestock conversion of feed to desired products or outcomes, such as improved reproductive performance. For example, if strategic supplementation practices could reduce annual winter feed costs by \$1 per cow, the savings to the western U.S. beef cattle industry would be approximately \$6.7 million annually.
4. Exchange of ideas, information, and data through sponsoring symposia or workshops on forage-based ruminant management strategies.
5. Transfer of knowledge to livestock producers by publication of a book on strategic supplementation practices and additions to the Cattle Producer’s Library has the potential to improve economic efficiency and system sustainability.

### **EDUCATIONAL PLAN:**

1. Co-sponsor and coordinate regional symposia on topics related to our objectives.
2. Involve graduate students and postdoctoral fellows in committee activities and meetings to enhance their educational opportunities.
3. Invite extension specialists and industry professionals to participate in committee activities and meetings to promote dissemination of our information to the livestock industry.

4. Develop publications on supplementation practices to be used for extension and teaching purposes, including:
  - Agricultural experiment station bulletin on strategic supplementation
  - Contributions to western region Cattle Producer's Library
5. Consider other opportunities to disseminate research information, such as web sites or CD-ROM libraries.

**PARTICIPANTS:**

Twenty-five people have requested participation in this WCC via submission of Appendix H. This includes faculty from 11 universities and scientists from 2 USDA-ARS locations. Among the university faculty, there are 21 with research appointments, 8 with extension appointments, 16 with teaching appointments, and 2 with diagnostic service appointments. This diversity in roles will contribute to the ability of the WCC to complete its expected outcomes and educational plan. Please see the attached sheet listing the individuals intending to contribute.

**OPERATIONAL STRUCTURE:**

Annual meetings will be held in conjunction with the annual meeting of the Western Section of the American Society of Animal Science or other professional meetings, when possible, to encourage attendance by graduate students, postdoctoral fellows, extension personnel, and others interested in our objectives.

Officers will include a chair and a secretary.

- Duties of the chair are to organize the annual meeting and coordinate communication between meetings through an email group consisting of the members and participants of the committee.
- Duties of the secretary are to take minutes at the annual meeting and to prepare the annual report.
- An individual will be elected at each annual meeting by the participants to serve as secretary and chair-elect.

**SIGNATURES:**

\_\_\_\_\_

Administrative Advisor

\_\_\_\_\_

Date

\_\_\_\_\_

Chair, Western Director's Association

\_\_\_\_\_

Date

Participants

Location	Name	Specialty	Appointment			
			Res.	Ext.	Tch.	Diag.
Arizona	Robert M Kattnig	Range Animal Nutrition		100		
Arizona	James E. Sprinkle	Range Animal Nutrition		100		
Arizona	Peder Cuneo	Veterinary Specialist	10		10	80
Arizona	Howard M Frederick	Consulting Nutrition				
Arizona	Ted Noon	DIAGNOSTICIAN			10	90
Colorado	Larry R. Rittenhouse	Range Ecology, Range Animal Nutrition	50		50	
Hawaii	James R. Carpenter	RUMINANT NUTRITION, GRAZING LIVESTOCK NUTR.	55	20	25	
Hawaii	Brent A Buckley	Beef Extension Specialist	20	70	10	
Hawaii	Brad R. Leamaster	Extension Veterinarian	20	70	10	
Hawaii	Burton J. Smith	Range & Livestock Extension Specialist	35	65		
Montana	Derek W. Bailey	Range Ecology	100			
Montana	Pat Hatfield	Ruminant Nutrition, Sheep Production	70		30	
Montana	John Paterson	Beef Cattle Nutrition	20	70	10	
Montana	Ray Ansotegui	Range Animal Nutrition, Beef Cattle Production	30		70	
Montana	Jan Bowman	Beef Cattle Nutrition	50		50	
Mont. ARS	Elaine Grings	Ruminant Nutrition	100			
North Dakota	Greg Lardy	Ruminant Nutrition	40	60		
North Dakota	Joel Caton	Ruminant Nutrition	80		20	
No. Dak. ARS	James F. Karn	Ruminant Nutrition	100			
Oregon	Timothy DelCurto	Range Beef Nutrition & Management	70		30	
South Dakota	Scott Kronberg	Range Animal Nutrition	65		35	
Texas	J.E. Huston	Range Animal Nutrition	100			

Utah	Kenneth C. Olson	Grazing Livestock Nutr. & Management	50	50
Washington	Mark L. Nelson	Ruminant Nutrition	50	50
Wyoming	Bret W. Hess	Ruminant Nutrition, Grazing Livestock Nutr.	50	50

---