Minutes of NRSP-7 Spring Annual Meeting 2008
April 21st and 22nd, 2008

LOCATION: U. S. Food and Drug Administration
Center for Veterinary Medicine
Room E370, 3rd floor
7500 Standish Place
Rockville, MD 20855-0001

Date: April 21st, 2008
ATTENDEES: The NRSP-7 technical committee, which is made up of a National Coordinator, four Regional Coordinators, four regional Administrative Advisors, and liaisons from USDA and FDA. The National Coordinator is Dr. John Babish (Cornell University). The Regional Coordinators are Dr. Lisa Tell (University of California, Davis), Dr. Alistair Webb (University of Florida), Dr. Ronald Griffith (Iowa State University), and Dr. Paul Bowser (Cornell University). The Administrative Advisors are Dr. Garry Adams, Chairman of Administrative Advisors (Texas A&M), Dr. David Thawley (University of Nevada), and Dr. John Baker (Michigan State University). The USDA/CSREES liaison is Dr. Gary Sherman (Washington, DC) and the FDA liaison is Dr. Meg Oeller (Rockville, MD). Dr. Bernadette, M. Dunham, Director, Center for Veterinary Medicine, Mr. John Hamilton ANR Federal Relations Liaison of UC Davis, Dianne Miller, Director of Federal Government Relations for Cornell University, Dustin Bryant of Meyers and Associates for Texas A&M University and Dr. Mark T. Lutschaun, Director Governmental Relations Division American Veterinary Medical Association.

INVITED STAKEHOLDERS

INDUSTRY	NAME	email
Dairy Goats (American Dairy Goat Association)	Linda Campbell	Linda@Khimaira.com
Deer (Texas Deer Association)	Scott Bugai	Docbatm90@aol.com
Deer (North American Deer Farmers Association)	Shane Donely Shawn Schafer	vetdonley@yahoo.com schafer@nadefa.org
Game Bird (North American Game Bird Association)	Eva Wallner-Pendleton	eaw10@psu.edu
Honey Bees (American Bee Keeping Association)	Troy Fore	troyfore@abfnet.org
Meat Goats (American Meat Goat Association)	Marvin Shurley	marvin@sonoratx.net
Rabbit (American Rabbit Breeders Association)	Chris Hayhow	ohiostatebuckeyes@kc.rr.com
Sheep (American Sheep Industry)	Paul Rodgers	prodgers2@earthlink.net

NRSP-7 INTRODUCTION

The National Coordinator **Dr. Babish** began the meeting by asking each attendee to give a brief introduction. The introductions were followed by an overview of NRSP-7 by Drs. Babish and Adams, who then introduced **Drs. Gary Sherman,** USDA/CSREES liaison to NRSP-7 and **Garry Adams,** Chair Administrative Advisors.

Drs. **Babish** and **Adams** described the mission of NRSP-7 as:

1. *Identify* animal drug needs for minor species and minor uses in major species,
2. *Generate* and *disseminate* data for safe and effective therapeutic applications, and
3. *Facilitate* FDA/CVM approvals for drugs identified as a priority for a minor species or minor use.

To accomplish these goals, NRSP-7 functions through the coordination of efforts among animal producers, pharmaceutical manufacturers, FDA/CVM, USDA/Cooperative State Research, Education, and Extension Service, universities, State Agricultural Experiment Stations and veterinary medical colleges though out the country.

The presentation went on to describe the operational flowchart and NRSP-7 technical committee. As background the following points were presented:

- Program initiated in 1984 as an IR-4
- Changed to NRSP in late 1980s as a method of administration.
- Previously funded as Line Item in USDA budget.
- Current funding levels are $279,420 divided over four regions.
- Included in 2007 Farm Bill (Sen. Barrasso of WY)
- Included in President's 2009 budget as line item in USDA

Funding levels from 1982 to the present were reviewed. During this time, the accomplishments of NRSP-7 were:

- 33 Public Master Files have been published during the 25 years of the program - 1.3 approvals per year.
- Mean expenditure per approval is approximately $450K or 10 to 40% of cost to industry.
- Five peer-reviewed publications in 2007.

Finally, the 14 active projects and 41 potential projects were described for the stakeholders.

USDA/CSREES INTRODUCTION

In brief overviews, **Dr. Sherman** described the activities of USDA/CSREES. CSREES' mission is to advance knowledge for agriculture, the environment, human health and well-being, and communities. CSREES-funded research spans problems and issues encompassed within 13 national emphasis areas.

- Agricultural & Food Biosecurity
- Agricultural Systems
- Animals & Animal Products
- Biotechnology & Genomics
- Economics & Commerce
- Education
- Families, Youth & Communities
- Food, Nutrition & Health
- International
- Natural Res. & Environ.
- Pest Management
- Plants & Plant Products
- Technology & Engineering

Dr. Sherman went on to compare the Mission and funding of the NRSP-4 (IR-4) program to the NRSP-7 program. IR-4 Project Mission Statement: Provide safe and effective pest management solutions for growers of specialty crops.

IR-4 Project Funding

Principal sources:

- USDA CSREES
- USDA ARS

- USDA Multi-State Hatch funds, through SAES]
- Agrichemical industry
- Specialty crop commodity group stakeholders.

Funding for the IR-4 program from USDA/CSREES is $10.4 million/year in comparison to the $0.58 M for NRSP-7, or 18 times the amount. This discrepancy is further emphasized when the effect of minor crops and minor species on the US economy is considered. While the impact of minor species on the US economy is approximately $33 billion, the IR-4 estimate of the effect of minor crops on the US economy is $7.7.

CVM INTRODUCTION

Dr. Bernadette M. Dunham, Director, Center for Veterinary Medicine, presented on minor use and minor species animal drug development.

Background - The Problem - Minor uses and minor species markets are too small to be economically worthwhile for pharmaceutical sponsors to seek FDA approval for drugs for these markets. Therefore, incentives are needed.

Definitions:

- Minor Species – ALL animals other than humans that aren't major species.
- Major Species
  - Cattle
  - Swine
  - Chickens
  - Turkeys
  - Horses
  - Dogs
  - Cats
- Minor Use in a Major Species
  - The intended use of a drug in a major species for an indication that occurs infrequently and in only a small numberof animals, or in limited geographic areas and in only a small number of animals annually
- Drug Approval Requirements
  - A New Animal Drug Application (NADA) contains:
    - Effectiveness data
    - Target animal safety data
    - Environmental safety data
    - Manufacturing chemistry information
    - Human food safety data (for food-producing animals)
    - Labeling & Freedom of Information Summary
    - All Other Information
- Assistance
  - Drug Approvals
  - Extra-label use
  - Extrapolation from major species studies
  - Limited "crop/species grouping"
  - NRSP-7 program (more on this later)
  - Medicated feed Compliance Policy Guidefor minor species
  - Waivers from user fees
- Minor Use & Minor Species Animal Health Act of 2004
  - Provisions of the Law
    - No reexamination of original approval
    - Exclusivity for residue studies
    - Conditional Approval
    - Indexing
    - Designation
    - Establish Office of MUMS

- No Reexamination of Original NADA
  - Sponsors are often leery of filing minoruse supplements if they think their existing approvals are at risk
  - This provision means no reconsiderationof the approved file
  - However, this does not mean that the review of the new claim reflects positively on the existing approval(s)
- Exclusivity for residue studies
  - The sponsor of an NADA can receive 3 years protection from generic copying for a supplemental approval (such as adding a species) when they have provided significant new effectiveness or target animal safety data.
  - This law also gives this protection to *MUMS drugs* when the sponsor has done residue depletion studies.
- Conditional Approval
  - Allows early marketing to get some return on investment for sponsors
  - Drug must meet *all* approval requirements *to current standard* except for effectiveness at time of Conditional Approval
  - Sponsor has up to 5 years (annual renewals) to complete effectiveness section to the full standard and receive a regular NADA approval
  - For minor use or minor species
  - Special labeling
  - Terminate conditional approval for cause or lack of progress
  - Already seeing conditional approvals
  - ONADE drafting proposed rule
- Indexing
  - Legally-Marketed Unapproved Animal Drug Index (the Index)
  - Applies to non-food (or early life stages) minor species only (*Not* sheep or goats)
  - Three step process
    - Eligibility
    - Expert panel
    - Request for indexing
  - Inclusion on Index based on report of an outside expert panel (FDA must agree)
  - Problems can result in removal from Index
  - In the case of "early life stages" of food-producing species, ONADE Human Food Safety team must review the use
  - Environmental reviews, if concerns
  - *Possibly* consults to other groups for review of user safety or manufacturing issues
- Designation
  - Comparable to human "Orphan Drugs"
  - Incentives
    - eligibility grants 7 years exclusive marketing
  - Sponsors may request designation for a specific claim (drug/species/intended use)
  - Once a claim is designated, no other designation for the same claim
  - Sponsor must provide annual reports to show progress toward approval
- Small Numbers Rule
  - To define "minor use in a major species"
  - Proposed rule with "small numbers" for the 7 major species published (Federal Register - March 18, 2008)
  - http://a257.g.akamaitech.net/7/2572422/01jan20081800/edocket.access.gpo.gov/2008/pdf/E8-5385.pdf
  - Proposed small numbers:
    - 50,000 Horses

        - 70,000 Dogs
        - 120,000 Cats
        - 310,000 Cattle
        - 1,450,000 Pigs
        - 14,000,000 Turkeys
        - 72,000,000 Chickens
- Responsibilities of OMUMS
    - Drafting of implementing regulations
    - Designation of MUMS drugs
    - Review of grant applications (soon)
    - Indexing
    - Liaison to minor use / minor species stakeholders
    - Liaison to NRSP-7

LOBBYING EFFORTS OF NRSP-7

Mr. John Hamilton, Ms. Dianne Miller and Mr. Dustin Bryant gave updates on the lobbying efforts of the institutions participating in NRSP-7 as well as the status of the 2007 Farm Bill currently in committee. Dr. Mark T. Lutschaun emphasized the importance of NRSP-7 and the support his organization, the American Veterinary Medical Association, has for the program.

ROUNDTABLE DISCUSSION OF NRSP-7 AND SAC COORDINATION FOR THE YEAR
(Working Lunch)

All attendees. Leaders John Babish, John Hamilton, Dianne Miller and Dustin Bryant.

Future lobbing efforts and stakeholder participation were discussed. Action items included further contacts with stakeholder lobbyists indicating the need to support funding for NRSP-7 in the USDA budget as well as inclusion into the 2007 Farm Bill.

NRSP-7 AND FDA/CVM'S ROLE

Dr. Meg Oeller, FDA liaison to NRSP-7 reviewed the mission and organization of NRSP-7 and the relationship between NRSP-7 and CVM.

NRSP-7 Process in a Nutshell

- Animal Drug Request (ADR) to Regional Coordinator (4 Regions)
- Accepted projects funded
- Data generated as by any sponsor
- Data availability published in Federal Register (Public Master File)
- Pharmaceutical company files NADA using NRSP-7 Public Master File by reference

NRSP-7 Liaison is like a Regulatory Affairs Person

- Logs in ADR officially
- Requests INAD, environmental categorical exclusion, & slaughter authorization
- Sets up pre-submission conferences and other meetings
- Submits protocols and studies forCVM review
- Writes FOI Summary sections
- Compiles 'technical section complete' letters, protocols, final study reports, and FOI Summary into a Public Master File
- Requests publication of a Federal RegisterNotice announcing availability of the data to support a New Animal Drug Application
- Celebrates when a pharmaceutical company files an NADA using these data!
- Communicates *a lot* with Nationa and Regional coordinators, academic researchers, producers, consumers, regulated industry, other government agencies…
- Gives presentations to industry, veterinary groups, producers, and government in and outside of FDA

TABLE 1. NRSP-7 APPROVALS

DRUG	CLAIM	SPECIES
Monesin	Coccidiosis	Goats
Amprolium	Coccidiosis	Pheasants
Thiabendazole	Gapeworm	Pheasants
Ivermectin	Warbles	Reindeer
Decoquinate	Coccidiosis	Sheep
Oxytetracycline	Gaffkemia	Lobsters
Bacitracin	Ulcerative enteritis	Quail
Monensin	Coccidiosis	Quail
Sulfa/ormetoprim	Bacterial infection	Catfish
Ivermectin	Ear mites	Foxes
Decoquinate	Coccidiosis	Goats
Salinomycin	Coccidiosis	Quail
Lasalocid	Coccidiosis	Rabbits
Fenbendazole	GI parasites	Goats
Ivermectin	Hypodermosis	Bison
Fenbendazole	Lungworms	Bighorn Sheep
Sulfa/ormetoprim	Coccidiosis	Partridges
Morantel tartrate	GI parasites	Goats
Ceftiofur	Bacterial pneumonia	Sheep
Formalin	External protozoans	Shrimp
Ceftiofur	Bacterial pneumonia	Goats
Lasalocid	Coccidiosis	Partridges
Formalin	Fungus/protozoans	Finfish/eggs
Tilmicosin	Respiratory infection	Sheep
Oxytetracycline	Otolith marking	Finfish fry
Tylosin	American foulbrood	Honey bees
Albendazole	Liver flukes	Goats

PRESENTATIONS BY REGIONAL COORDINATORS

NORTHEAST REGIONAL COORDINATOR – DR. PAUL BOWSER

An outline of the species grouping research conducted in the Northeastern Region was given by **Dr. Bowser**.

Focus has been on Human Food Safety (tissue elimination studies)

- Model Species (Species Matrix)
- Tilapia
- Walleye
- Hybrid Striped Bass
    - Summer Flounder

Initial effort on:

- Extension of existing labeled drugs
- Terramycin for fish
- Romet-30
- Aquaflor (florfenicol)

Results to date indicate species grouping is a viable method for the reduction of animals used in research.

NORTH CENTRAL REGIONAL COORDINATOR – DR. RONALD GRIFFITH

Dr. Griffith described the North Central Region's efforts on several of the active projects in his area relating to the present stakeholders.

CIDRg

- CIDR is a progesterone implant used to synchronize estrus cycles in sheep & goats
- Uses a steroid hormone, Progesterone
- Targets the hypothalamus in a negative feedback
- Targets mammary glands & uterus in a positive feedback

Success

- A study at North Dakota State using CIDR's resulted in 100% synchronization, the highest in comparison to any other technique
- Success can be determined by
- Ultrasound
- Watching for signs of estrus
    - Pregnancy

CIDRg in Sheep

- Progesterone-containing intravaginal sponge.
- Human Food Safety has not been completed in the U.S. thus it is not approved for use.
- Nearing Approval….
- Need to verify stability of progesterone in muscle and liver.

CIDRg in Goats

- Milk Residue Study close to submission.
- Effectiveness

Tulathromycin (Draxxin®)

- Macrolide antibiotic (like erythromycin, tylosin, tilmicosin).
- Single Injection.
- Long-acting (effective lung levels for a week)… long withdrawal time.
    - Currently approved for use in Cattle and Swine.

Current Status of Draxxin in Goats

- Target Animal Safety Study is nearing completion.
- Protocols for Efficacy have been submitted. AUC/MIC vs. Field Trials
- Protocol for Tissue Residues has been approved. Western Region is working on analytical phase.

Lasalocid in Ring-necked Pheasants

- Effectiveness Study was completed at the University of Georgia last fall.
- First draft of the study report was submitted on 4-16-08.
- TAS protocol has been submitted and study is planned for this summer at UGA.
- HFS protocol is nearing completion.

Bioclip (Epidermal growth factor)

- Merck-Merial has the rights to this drug
- Currently evaluating whether to market in the U.S.
- Seems to be very little interest from Merck-Merial

Regulin

- Melatonin implant
- Sheep are seasonally polyestrus
- Regulin implanted in May and June would allow early July breeding/late Nov. & early Dec. lambing.
- Approved for use in Europe and Australia

Fasinex® (Triclabendazole)

- Treatment of liver flukes in deer and elk.
- Not approved for any species in the US.
- Approved in Europe for cattle.

Other Drugs

Fecundin (Androstenedione-7HSA in DEAE dextran adjuvant)

- Increases rate of multiple births in sheep.
- Approved for use in Europe and Australia

SOUTHERN REGIONAL COORDINATOR – DR. ALISTAIR I. WEBB

Dr. Webb presented an overview of research in the Southern Region, focusing on project tracking, game bird projects and the NRSP-7 website (

WESTERN REGIONAL COORDINATOR – DR. LISA TELL

Dr Tell began her presentation by reviewing the historical NRSP-7 accomplishments of the Western Region as summarized in the following Table.

Table 2. Western Region Historical Projects

DRUG	FORMULATION	SPECIES	STATUS
Ivermectin	Injectable	Reindeer	Approved
Fenbendazole	Premix	Big Horn Sheep	Approved
Ceftifur	Injectable	Sheep	Approved
Formalin	Powder	Sheep	Approved
Tylosin	Powder	Honey Bees	Approved
Formalin	Powder	Finfish and Eggs	Approved
Ceftifur	Injectable	Goats	Approved
Albendazole	Oral suspension	Goats	Approved
Amoxicillin trihydrate	Injectable	Sheep	Public Master File

Table 3. Western Region Current Projects

DRUG	FORMULATION	SPECIES
Erythromycin	Premix	Salmonids
Lincomycin	Powder	Honey Bees
Progesterone	CIDRg	Goats
Tulathromycin	Injectable	Goats

Goat specific studies included:

1. Ceftiofur sodium (Bacterial pneumonia)
2. Decoquinate (Coccidiosis)
3. Monensin (Coccidiosis)
4. Fenbendazole (GI parasites)
5. Morantel tartrate (GI parasites)
6. Albendazole (Liver flukes)
7. Clorsulon (Liver flukes) 5440 PMF
8. Levamisole (GI parasites) 5117 PMF
9. Ivermectin (GI parasites) 3883 PMF

Finally, a detailed description was presented of the pharmacokinetics of ceftiofur crystalline free acid (CCFA) in non-lactating domestic goats (*Capra aegagrus hircus*) following a single subcutaneous (SC) injection.

Conclusions :

- A single subcutaneous injection of CCFA did not result in any adverse effects.

- Serum concentration of CCFA remained above therapeutic concentrations for at least 4 days.

STAKEHOLDERS PRESENTATIONS

Stakeholder presented information on the regional value of their industry as well as the specific therapeutic and other drug needs.

NORTH AMERICAN GAME BIRD ASSOCIATION (NAGA)

NAGA was represented by Dr. Eva Wallner-Pendleton of The Pennsylvania State University.

Economic Impact, Current Research & Medication Needs

- Raised in all 50 states, NAGA: 1200 members +
- Pheasants, bobwhite quail, chukars, mallards, wild turkeys, hungarian partridge (not fighting cocks!!)
- Production facilities and sport hunting preserves
- Estimated at 5.0 billion dollars in economic activity
- 14,000 game bird producers nationwide
- 25 % full-time income derived from business
- Top game bird-producing states:
    - Texas, North Carolina, Pennsylvania, Kansas, Wisconsin, New York, Illinois, S. Dakota, Florida, Minnesota, Iowa, Georgia, Missouri, Indiana, Alabama
- Significant impact especially in rural areas.
    - Feed, jobs, outdoor recreation, tourism, hunting fees, kennels, lodging, sale of birds, meat production, buildings, energy sales, 16 million acres for habitat preservation

- Multiple farms producing 250,000 to 1.8 million birds.
- Major Disease Challenges
- Bacterial infections
- Salmonella, Clostridial infections, E. coli
- Intestinal parasites
- Gape worms, intestinal worms
- Intestinal coccidiosis
- Huge problem in upland game birds
- Very few and mostly ineffective medications
- Up to 40% death loss in chukars from this disease

Why is research for approved drugs (esp. feed medications) so important for this industry?

- Most veterinarians in these states know almost nothing about diseases in game birds or how to properly prescribe medications.
- Water treatments difficult to administer to these birds that are raised outdoors.
- Food safety
- Coccidiosis alone is holding back game bird production by at least 10-25%.

Future is very bright for game bird industry growth, however, research into safe and effective medications will play a huge role in helping this industry reach it's full potential.

AMERICAN RABBIT BREEDERS ASSOCIATION (ARBA)

Dr. Chris Hayhow, representing ARBA, gave the presentation on the rabbit industry in the US and its therapeutic needs.

Industry size - The American Veterinary Medical Association reported that in 2006 approximately 2,000,000 households owned rabbits. In addition, approximately 600,000

households owned cavies. The American Rabbit Breeders Association (ARBA) is the largest organization in the world devoted to rabbits and cavies. The ARBA has approximately 28,000 members. These members raise rabbits and cavies as pets, for show, and for commercial use.

Scope of the rabbit industry - The rabbit industry includes raising of lagomorphs for pets, meat, pelts, wool, animal by-products and research. The market is divided into five major segments with common overlap. These segments are meat, fur, exhibition and breeding, pet and laboratory businesses. Precise data on the size of the U.S. rabbit industry is not available.

Current employment - The number of people employed by the rabbit industry is difficult to estimate. This number includes farmers growing crops for consumption by rabbits and cavies, feed mill workers, rabbit growers, pet supply personnel, lab personnel, family members that make a living selling rabbits or rabbit related products, and end users such as restaurant personnel.

MUMS Bill - With approval of the MUMS bill the potential for enhanced animal health and production, improved public relations, and increased consumer acceptance and satisfaction is enormous.

Improved availability of drugs, improved communication between professionals and end users, and improved animal health will be possible.

Current animal losses –Due to the lack of available drugs, an extremely small percentage of rabbits and cavies receive preventative or therapeutic medications, when needed. In some situations the herd morbidity and mortality rates are very high. The resulting losses can be very high financially and emotionally.

Animal welfare issues - Due to diminished availability of drugs to treat rabbits and cavies, most animals either go untreated, or treatment is delayed. This leads to decreased treatment success. The result is increased suffering, loss of use, and loss of life for affected animals. The emotional impact of these losses are difficult to measure.

Public health significance - The human-animal bond is strong and the emotional attachment to animals is tremendous. The risk of transmission of zoonotic diseases is always present. A dollar amount can not be attached to these numbers.

The meat industry - The meat production segment is very fragmented and few producers can maintain a continuous supply of rabbits to meet slaughter demand. This fluctuation in animal numbers leads to producers contracting with other growers to fill orders and meet demand. The result is a product that lacks uniformity and quality at the retail level.

Fur and wool markets - The fur and wool markets have declined in recent years for numerous reasons. Whether the problem is consumer dissatisfaction due to price, quality of the product, pressure from foreign markets, or public perception of fur products, the negative impact has lead to further demise of the rabbit fur industry.

Exhibition and breeding - Exhibition and breeding are fast growing segments of the rabbit industry. The ARBA has over 28,000 members. At the 2007 Annual Convention and Show over 24,000 rabbits and cavies were exhibited. The number of rabbits exhibited at ARBA sanctioned shows has increased from 595,960 in 1990 to 885,895 in 2006. These numbers do not include shows not sanctioned by the ARBA, such as 4-H and local fairs.

Pets - One of the fastest growing animals of pet ownership is the rabbit. Acceptance of rabbits as household pets will continue to increase and some are actually housebroken and trained to do tricks. This trend will lead to increased demand by clients for products to maintain health and treat disease problems.

Laboratory use - Laboratory use of rabbits is a well-developed business. With decreases in research funding and development of alternative animal models, the use of rabbits in research settings continues to decline. Most estimates put the decline at over 50% since the mid 1960's.

Therapeutic needs - It is obvious that the rabbit industry is very large. Rabbits face challenges similar to other animals raised in confinement. They face infectious diseases, internal parasites, external parasites, and production problems that require therapeutic agents. Unfortunately this minor species has few drugs that have been tested and approved by FDA.

Only three products are licensed by FDA for use in rabbits in the U.S. These products are sulfaquinoxaline, lasalocid, and tetracycline. Sulfaquinoxaline is used as an aid in the prevention of coccidiosis. Lasalocid is used for the prevention of *Eimeria stiedea*. Tetracycline is used for increased growth and improved feed efficiency.

The U.S. market needs the following products based on current management practices. Antibiotics for therapeutic use such as enrofloxacin and trimethoprim are broad spectrum, and could be used to treat infections due to *Pasteurella multocida* and other bacterial agents. Antiparasiticides such as Amprolium, salinomycin, fenbendazole, and ivermectin could be used to treat susceptible internal parasite infestations. Also, ivermectin could be used to treat susceptible external parasite infestations. Hormones such as receptal for induction of ovulation for post partum insemination are needed. An antifungal medication such as griseofulvin is needed.

With very few approved products, and the legal restrictions of owners treating animals with unapproved therapeutics there are few alternatives. The Animal Medicinal Drug Use Clarification Act (AMDUCA) made it easier to obtain therapeutics through a veterinarian. Unfortunately, the economics of the rabbit industry does not include widespread use of veterinarians. Owners tend to treat their own animals using mass medication via the feed or water.

AMERICAN BEE KEEPING ASSOCIATION

Representing the ABA, Troy Fore provided information on the value of bees in US agriculture and the issues of colony collapse disorder and American foulbroud in bee keeping culture. The economic impact of bees in US agriculture is summarized in the following table.

TABLE 4. Leading States and US Economic Impact of the Honey Bee Industry

INDUSTRY	LEADING STATES	US FARM GATE VALUE [$M]	US ECONOMIC IMPACT [$M]
Honey Bees	ND, CA, SD, FL, MT, MN, TX, & WI.	$153	$16,000

NORTH AMERICAN DEER FARMERS ASSOCIATION /TEXAS DEER ASSOCIATION

Shane Donely and Shawn Schafer, representing the NADFA, and Scott Bugai or the Texas Deer Association, provided data and background for the following table.

TABLE 5. Leading States and US Economic Impact of the Cervid Industry

LEADING STATES	US FARM GATE VALUE [$M]	US ECONOMIC IMPACT [$M]
TX, PA, OH, FL, LA, IA, & KS	$894 (farming) $757 (hunting)	$3,000

Source: Administrative staff NADeFA.

The cervid family includes whitetail deer, elk, fallow deer, reindeer, axis, sika and red deer. In general the production side of the industry is composed of breeding stock producers, trphy hunting preserves, commercial venison producers, and commercial scent collection. Across the nation, the total number of cervid farms was 7,828, with TX and PA home to around 1,000 farms each.

AMERICAN MEAT GOAT ASSOCIATION (AMGA)

Marvin Shurley presented information on meat goat production in the US on behalf of the AMGA.

TABLE 6. TOTAL US GOATS AS OF FEB 2008

TYPE OF GOAT	NUMBERS
Angora goat	210,000
Dairy goat	305,000
Meat and other goats	2,500,000
US total goat numbers	3,015,000

TABLE 7. NUMBER OF HEAD AND VALUE OF TOP TEN MEAT GOAT PRODUCING STATES

STATE	HEAD	VALUE [000S]
TX	1,090,000	$101.2
TN	118,000	$11.0
CA	100,000	$9.3
GA	100,000	$9.3
OK	86,000	$8.0
NC	82,000	$7.6
KY	81,400	$7.6
MO	80,000	$7.4
FL	71,000	$6.6
AL	59,000	$5.5

Top ten producing states are home to 75% of the US Meat Goat heard

TABLE 3. U.S. GOAT SLAUGHTER NUMBERS1-1-07 THROUGH 12-31-07

USDA Inspected	639,400 head
State Inspected	187,900 head
On Farm (~25%)	206,825 head
Total US Kill	1,034,125 head

Unlike most livestock species only 62% of goat killed are slaughtered under Federal inspections

Summary Overview of the Goat Industry

Since 2006 U.S. Meat Goat numbers have increased by 9% with no projected drop in future growth. U.S. Dairy Goats show a 5% increase, and U.S. Angora Goats show a 19% decline in population for the same period (USDA/NASS numbers used)

AMERICAN DAIRY GOAT ASSOCIATION

A characterization of the American dairy goat industry was presented by Ms. Linda S. Campbell, President, American Dairy Goat Association.

Diary goat products include milk, cheese, meat, fiber, seed stock, browsing and companionship. Breeding stock export market was $14.8 million in 2003 and dairy goat sales are valued at $250 million annually (2007).

Therapeutic and Production Needs of the Dairy Goat Industry

- Estrus Induction/Synchronization
- Milk Quality/Mastitis - Quality Assurance Issues
- Anthelmintics
- Animal Welfare/Pain Management

AMERICAN SHEEP INDUSTRY (ASI)

Mr. Paul Rodgers joined the meeting via teleconference and provided statistics as described in the table below.

TABLE 8. LEADING STATES, FARM GATE VALUE AND ECONOMIC IMPACT OF THE SHEEP INDUSTRY IN THE US

LEADING STATES	US FARM GATE VALUE [$M]	US ECONOMIC IMPACT [$M]
TX, CA, WY & CO	$750	$4,500

Meeting was adjourned at 4:45 pm

TABLE 9. Overview of Minor Species Industries, Leading States, Farm Gate Value and Economic Impact in the US.

Industry	Leading States	US Farm Gate Value [$M]	US Economic Impact [$M]	NRSP-7 Activity	
				Approvals	Active
Game Bird	TX, NC, PA, KS, WI, NY, IL, SD, FL, MN, IA, GA, MS, IN & AL.	$830	$5,000	Chukar partridges Sulfadimethoxine/Ormetoprim Lasalocid Pheasants Amprolium Thiabendazole Quail Salinomycin Bacitracin Monensin	Pheasants Lasalocid Sulfadimethoxine/Ormetoprim Fenbendazole
Rabbits	CA, GA, OH, PA, & TX	$20	$831	Laslocid	Ivermectin
Honey Bees	ND, CA, SD, FL, MT, MN, TX, & WI.	$153	$16,000	Tylosin	Lincomycin
Cervid	TX, PA, OH, FL, LA, IA, & KS	$894 (farming) $757 (hunting)	$3,000	Bison Ivermectin Reindeer Ivermectin	Deer Lasalocid Fallow Deer Fenbendazole
Meat Goats	TX, TN, CA, GA, OK, NC, KY, MO, FL, & AL	$173.2 $189 (breeding)	$1,039	Fenbendazole Monensin Decoquinate Morantel tartrate	Lasalocid CIDR (progesterone) Tulathromycin
Dairy Goats	TX, OH, NY, PA, WI, WA, IN, CA, MD, MN, MI, FL, & KS.	$58.3 $14.8 (export)	$439	Fenbendazole Monensin Decoquinate Morantel tartrate	Lasalocid CIDR (progesterone) Ceftiofur HCl (Intramammary) Tulathromycin
Sheep	TX, CA, WY & CO	$750	$4,500	Bighorn Sheep Fenbendazole Sheep Decoquinate Ceftiofur Tilmicosin phosphate	Sheep CIDR (progesterone) Tulathromycin
Catfish/Aquaculture	Catfish MS, AK, AL, & LA Trout WA, WI, PA, ID, NC, OR, NY, CA, & CO	Catfish $480 Trout $87.5	$2,880 $159	Catfish Sulfadimethoxine/Ormetoprim Finfish Formalin Oxytetracycline Lobster Oxytetracycline	Fish Sulfadimethoxine/Ormetoprim Florfenicol Erythromycin Carp pituitary Strontium chloride Oxytetracycline
		Total = 4,407	Total =$33,848		

Tuesday April 22st, 2008
LOCATION: Deli Conference Room
7529 Standish Place, Suite 140 FDA/CVM,
Rockville, MD

ATTENDEES:

NAME	AFFILIATION	EMAIL ADDRESS
David Thawley	University of Nevada	thawley@cabnr.unr.edu
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Paul R. Bowser	Cornell University	prb4@cornell.edu
Ronald W. Griffith	NRSP-7/Iowa State University	rgriffit@iastate.edu

REPORT FROM USDA-CSREES – DR. GARY B. SHERMAN

Dr. Sherman described the progress of NRSP-7 Funding within the USDA and a discussion ensued concerning the beginning and ending of FY funding for the years 2007, 2008 and 2009. This discussion concerned both the USDA and multi-state funding.

REPORT FROM THE ADMINISTRATIVE ADVISORS – DR. L. GARRY ADAMS

Dr. Adams described the process of regional lobbying support at Ag Experiment Station level and the participation of Texas A&M, Cornell University and the University of California.

REPORT FROM THE NATIONAL COORDINATOR – DR. JOHN G. BABISH

The budget request process for multi-state funding from the Agricultural Experiment Stations was described by **Dr. Babish**. The FY09 request is for $335,000 and funding will be considered at the June meeting of Experiment Station Directors.

REPORT FROM FDA/CVM – DR. MEG OELLER

Dr. Oeller provided feedback and questioned each of the regional coordinators during their presentation.

REPORTS FROM THE REGIONS AND NEW PROJECTS:
NORTHEASTERN REGION - **DR. PAUL BOWSER**

INAD 9493 Hydrogen Peroxide as a Therapeutic Compound for Bacterial Gill Disease in Fish.

No additional work has been performed on this project during this study period.

SPECIES GROUPING PROJECT
INAD 10-320 Oxytetracycline in Fish
INAD 10-823 Romet-30 in Fish
INAD 11-145 Florfenicol in Fish

A primary constraint in the availability of therapeutic compounds for the Aquaculture Community is the relatively large number of fish species that are currently cultured or that have significant potential as commercial species. Currently, research in support of a label for a therapeutic compound must be performed separately for each

species for which the label is desired. We have undertaken a project designed to show the similarities in how drugs are handled by different fish species with the goal of supporting a species (crop) grouping concept for fish. We have conducted these studies in a collaborative effort with the Western Region NRSP7. Within this context, to date we have completed the following preliminary Human Food Safety/Tissue Depletion Studies using the following test articles as model compounds:

Oxytetracycline:

1. Walleyes, freshwater fish, 15C and 20C
2. Tilapia, freshwater fish, 25C and 30C
3. Hybrid Striped Bass, saltwater fish, 20C and 25C
4. Summer Flounder, saltwater fish, 17C and 20C
5. Rainbow Trout, cold water trial (8C)

Romet-30:

1. Walleyes, freshwater fish, 20C and 25C
2. Tilapia, freshwater fish, 25C and 30C
3. Hybrid Striped Bass (to be completed;see below)
4. Summer Flounder, saltwater fish, 17C and 20C

Florfenicol (10 mg/Kg/d, 10d):

1. Walleyes, freshwater fish, 20C and 25C
2. Tilapia, freshwater fish, 25C and 30C
3. Hybrid Striped Bass, saltwater, 20C, 25C

Florfenicol (Effect of fish size)

1. Tilapia – 100 gm, freshwater fish, 25C, 15 mg/Kg, 10d
2. Tilapia – 250 gm, freshwater fish, 25C, 15 mg/Kg, 10d
3. Tilapia – 500 gm, freshwater fish, 25C, 15 mg/Kg, 10d

Several attempts were made to conduct human food safety studies or Romet-30 in hybrid striped bass. The Sponsor has developed a product (Romet-TC) that circumvents the palatability problem and we anticipate efforts to complete the Human Food Safety/Tissue Elimination studies in that species soon.

WORK PLANNED FOR NEXT YEAR

ADR 259 Hydrogen Peroxide as a Therapeutic Compound for Bacterial Gill Disease in Fish. (INAD 9493)

No additional work is planned for this project in the upcoming year.

Species Grouping Project:

INAD 10-320 Oxytetracycline in Fish
INAD 10-823 Romet-30 in Fish
INAD 11-145 Aquaflor (Florfenicol) in Fish

We anticipate conducting Efficacy Studies in a collaborative effort with the New York State Department of Environmental Conservation. The particular focus of the efficacy trials will be for the treatment of bacterial diseases not currently on the label for salmonids and for the treatment of bacterial diseases of cool water species such as walleyes, muskellunge and tiger muskellunge (hybrid muskellunge X northern pike). These studies will be initiated when diagnosed field cases can be identified that will lend themselves to the implementation of controlled field studies. We also anticipate the

completion of Human Food Safety trials with Romet-TC in Hybrid Striped Bass at 20C and 25C.

PUBLICATIONS

Topic-Popovic, N. J.G. Babish and P.R. Bowser. 2007. Observational study of hepatic cytochrome P-450 protein expression and activity in summer flounder (*Paralichtys dentatus*) following combination ormetoprim-sulfadimetoxine treatment. Chemotherapy 53:313-315.

Kosoff, R.E., C.-Y. Chen, G.A. Wooster, R.G. Getchell, A. Clifford, A.L. Craigmill and P.R. Bowser. 2007. Sulfadimethoxine and Ormetoprim residues in three species of fish after 5-day oral dosing in feed. Journal of Aquatic Animal Health 19:109-115.

SOUTHERN REGION – **DR. ALISTAIR I. WEB**

ACTIVE REGIONAL PROJECTS:

ADR 107 INAD 9557 Ivermectin & Rabbits

TAS study is complete and waiting for statistical analyses to be re-done and the report completed. The human safety *in vivo* has been completed and the assay should be finished within six weeks. Spiked samples were created and frozen contemporaneously so freezer stability work should be very quickly completed. The QC progress on ADR 280 will determine the speed and method with which these reports will proceed. Expected projections would be for a Winter submission.

ADR 271 INAD 9757 Crude Carp Pituitary

The author of the TAS study has moved and contact has been temporarily lost. Readings on the report are very bleak. Progress on contacting the investigator will be made to the monthly teleconference when appropriate.

ADR 280 INAD 10-063 Fenbendazole & Gamebirds

All in vivo work has been completed and a digital submission of the human safety study report was created. Unfortunately the QC unit was not happy with it and FDA indicated that it was not ready to review such submissions. It has been recast as a paper submission under the guidance of the Western Regions QA unit and is being sent back for further QC input. The TAS report is waiting for the other review before being also recast as a paper submission. Unless the QC fails, both of these will be submitted by Fall.

ADR 294 INAD 10-746 Lasalocid & Deer

Progress on both the deer and goat lasalocid projects depends on the human safety results as the sponsor has made it clear that, without a zero withdrawal time, they are not interested in amending their label. The problems have been a miscommunication with the probable investigator [TAMU] and HPLC problems. Both are being resolved. The HPLC problem occurred with major (and expensive) mechanical problems while the service contract had been allowed to lapse due to the funding crisis. The contract was re-instated but a time had to pass before repairs could be called for to avoid a pre-existing exclusion occurring. Progress on protocol and the assay validation will be reported to the teleconference as appropriate.

ADR 298 INAD 10-872 Lasalocid & Goats

See ADR # 294

ADR 210 Fenbendazole & Red Deer

We are waiting for results of the dose confirmation study being conducted by subcontract by the sponsor. That and possible collaboration with the TAMU group will probably determine the probability that the sponsor will continue with the project.

ADR 216 Fenbendazole & Fallow Deer
See ADR # 210

SPECIFIC PROJECTS PROPOSED FOR 2008

See ADRs 107 & 280 above for details of report submissions.

The development of the lasalocid projects will continued in the case of the assay validation [expected to be completed late summer] and the communication error [Southern Region's solely] has been addressed and we are working to develop an active collaboration on this drug and possibly the fenbendazole & deer project.

The reported activities will require that we maintain lab and staff at GLP level although loss of some personnel with the funding cuts experience at the PI's laboratory has made that difficult.

We will continue to prepare, in coordination with the National Coordinator, INAD submissions for studies conducted under the aegis of the Southern Region. Initial preparation of written responses to CVM review of all of the data submitted for each project. This is often a time consuming and unrecognized activity associated with the completion of each project and may require considerable correspondence and conversation.

As usual we will be prepared to continued collaborative work with the other regions as requested. It is always possible that this may include unplanned studies to address critical needs and opportunities to collect data.

Finally we continue the development of the NRSP-7 web site with possible re-implementation of the RUSTi database.

OTHER ACTIVITIES

The NRSP-7 web site is maintained by the Southern Region. It attracts a daily average hit rate of 5-10 per day and has an international user base. We are working to introduce some interactive display of presentations and publications made to and by The Program.

WESTERN – **DR. LISA TELL**

ACTIVE REGIONAL PROJECTS:

ADR 325: Florfenicol for sheep for respiratory disease

Western region is waiting for an update regarding the manufacturer status of this product.

ADR 324: Progesterone CIDRs for Goats

Target Animal Safety report has been accepted by FDA/CVM (February 20, 2008). Milk residue study has been completed and the data sent to UC Davis. CVM has provided comments regarding efficacy protocol. Protocol revision is underway.

ADR 272: **Romet for Gamebirds**

See species grouping report.

ADR 299: Pirlimycin for Dairy Goats

Project on hold until funding is identified and CIDR goat studies are completed.

ADR 295: Strontium Chloride for Salmonids. Steve Schroeder

There is nothing to report. Status of the project needs to be changed.

ADR 338: Spectramast™ LC Sterile Suspension for Mastitis in Dairy Goats

Project on hold until funding is identified and CIDR goat studies are completed.

ADR 135: Erythromycin in Salmonids

Mark Gaikowski with the U.S. Geological Survey - Upper Midwest Environmental Sciences Center in La Crosse, Wisconsin is working in conjunction with NRSP-7 to

revise and review specific sections of the Environmental Assessment Report for resubmission to CVM. In order to address the CVM comments, a pilot chronic toxicity study with *Daphnia magna*, is currently underway, using erythromycin thiocyanate and diphenhydramine and the main study will be conducted later in the summer. The ultimate goal of these studies is to produce data that will address CVM's concerns regarding chronic toxicity to aquatic insects. Other studies underway include a study to identify physico-chemical properties of erythromycin and a study to determine the microbial toxicity of various erythromycin transformation products. Once again, these results will be used to address the concerns expressed by CVM. The last study to be considered is characterization of leaching of erythromycin from feed, feces, and sediment.

ADR 311: Lincomycin soluble powder for foulbrood disease in Honeybees

Western region is waiting for the data summary from investigators for CVM submission. Dr. Margaret Oeller is assisting to facilitate this CVM submission.

COLLABORATIVE PROJECTS:

ADR 280: Fenbendazole in Game Birds (Pheasants, bobwhite quail, partridge)
See Southern Region Report.

Ms. Ogletree and Dr. Webb met in February and discussed concerns regarding the QA portion of this project. Dr. Webb will be submitting additional information.

Species Grouping Fish:
See North Eastern Region Report.

Samples analysis for florfenicol is complete. For the fish species-grouping project, we have analyzed 120 muscle samples this year from trial number 2004-1.

ADR 324: Progesterone CIDRs for Goats: Milk Residue Study

Raw data for goat milk progesterone concentrations have been sent to UC Davis by Dr. Dennis Hallford from New Mexico State University.

ADR 340: Tulathromycin in Goats

QA was performed for the Target Animal Safety study in February and March by Ms. Ogletree.

QA review of TAS protocol is to be done by Ms. Sandra Ogletree.

The LCMS installation was completed in January 2008. The Western region has started working on establishing the approved analytical method in our laboratory.

OTHER PROJECTS:

Avian Species Grouping:

Krsity Cortright has finished her work on the *in vitro* and *in vivo* studies. She is completing her work for her PhD.

Excede (Ceftiofur Crystalline Free Acid) in Goats:

In collaboration with Drs. Rowe and Angelos, Dr. Elizabeth Dore (UC Davis 3rd year Food Animal Resident) completed the study evaluating use of Excede in non-lactating goats. The data from this study was compiled and presented at two scientific venues. The remainder of the study will be completed in June of 2008 in the lactating goats.

NORTH CENTRAL – **DR. RONALD W. GRIFFITH**

ADR 258: Sheep CIDR-G Tissue Residue Stability

This study was performed by Dr. Dennis Hallford at New Mexico State University in cooperation with both the Western and North Central Regions. The assays for the

freezer stability of progesterone have been completed, the data has been submitted to the CVM for review and arguments were submitted to CVM concerning the lack of residue in fresh liver. We are currently awaiting final word on whether the report will be accepted or whether we need to re-do all or part of the study.

ADR 324: Goat CIDR-G Tissue and Milk Residue

These studies are being supported by both the NC and Western Regions of NRSP-7. The in-life phase of milk residue study was performed at UC-Davis in fall 2007 and the analytical phase was performed by Dr. Hallford at New Mexico State University. The data from the study was recently submitted for QA to the Western Region. An issue arose that triplicate analyses needed to be performed on each milk sample if this were to be considered a depletion study. Dr. Hallford has re-configured the data and the statistical analysis to compare peak P4 levels (which is really the only critical criterion) and we will hopefully be OK with this data. The data indicate that progesterone levels in the milk of pregnant does are greater than progesterone levels in the milk of CIDR-treated does. Dr. Hallford plans on performing the tissue residue portion of the study this fall but wanted to wait for resolution of the sheep tissue residue issues. I have encouraged him to submit the goat protocol so that we can get it reviewed in time to begin the study.

ADR 324: Goat CIDR-G Effectiveness

The protocol was submitted and reviewed by ONADE. It was deemed not acceptable and there are numerous problems that need to be resolved dealing with the minimum number of study animals, location(s) of study, and whether we need to do dairy- and meat-breed goats as separate studies. ONADE is also requesting data be collected on reproductive safety

ADR 340: Draxxin Target Animal Safety in Goats

The in-life phases of the study were completed on March 22, 2008. The tissues from the untreated control and high-dose-group goats have been sectioned and stained. As soon as those are evaluated, we unmask the study and analyze the data. All the goats remained in good health except for one untreated control goat that developed respiratory disease. A few of the goats had some scattered lesions that seemed to be related to infectious processes rather than any toxic effects of the drug. In addition to the TAS portion of the study, we collected tissues and plasma for tulathromycin analysis for publication purposes.

ADR 340: Draxxin Efficacy in Goats

The protocol for a natural exposure model has been accepted by CVM. However, the studies were predicted to take at least three years to complete and require a significant portion of the financial resources of the NC Region. An alternative protocol based upon determination of AUC/MIC was prepared and submitted. However, ONADE wanted us to base statistical significance by comparison to cattle AUC/MIC. We were asked to provide an alternative target for determining effectiveness. It was decided that we needed some preliminary analytical and MIC data in order to set a realistic target. We are currently collecting bacterial isolates to perform the MIC. We completed the in-life phase of a PK study on April 11, 2008 to give us an idea of where the AUC is going to fall. Those plasma samples were shipped to Scott Wetzlich in Lisa Tell's lab. Once we have the preliminary data, we will discuss our target AUC/MIC with ONADE.

ADR 340: Draxxin Tissue Residue

The protocol has been reviewed by ONADE and there were relatively few comments. The protocol was amended and sent to Scott Wetzlich who will be doing the analysis. The methods for tissue extraction and tulathromycin analysis is currently being developed. This study can begin whenever the assays are validated. We will have tissues from goats at 2-, 3-, 4- and 5-weeks post treatment for determination of a target end point for the tissue residue study.

ADR 235: Lasalocid Efficacy in Pheasants

The study was performed by Drs. Larry McDougald and Lorraine Fuller at the University of Georgia with the assistance of Dr. Thomas McQuistion from Milliken University. A draft of the final report and an associated paper for publication was received on April 16, 2008 and will be reviewed.

ADR 235: Lasalocid TAS in Pheasants

The protocol for this study was submitted to ONADE for review and hopefully will be returned by early June. Drs. McDougald and Fuller have agreed to perform this study as well. The North Central Region will be funding the study and has also funded a Veterinary Summer Scholar to work on this project in Dr. McDougald's lab.

ADR 235: Lasalocid Human Food Safety in Pheasants

The protocol for this study is nearing completion and will be submitted soon. Our target for this study is sometime in the fall of 2008. The Southern Region lab will be doing the tissue analyses.

ADR 341: Regulin (melatonin) implants for sheep

No activity to report. There does not seem to be much interest in this product either from the manufacturer or the sheep and goat industry.

ADR 297: Fasinex (Triclabendazole) for Deer and Elk

No Activity to report.

Bioclip for Sheep

No activity to report.

FALL MEETING

It was decided to hold the fall meeting in the western region in concert, if possible, with the five-year review. Possible dates will be decided by email balloting.

OTHER BUSINESS

There being no other business, the meeting was adjourned at 1:45 pm.

Respectfully submitted:

John G. Babish, Ph.D. Date: 5/8/08
NRSP-7 National Coordinator