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### **Shepherd's Symposium Scheduled for January 4 & 5, 2002 52002**

The annual Virginia-North Carolina Shepherd's Symposium will be held Friday and Saturday, January 4 & 5, 2002 at the Donaldson Brown Hotel and Conference Center on the campus of Virginia Tech in Blacksburg. Please mark your calendars now and plan to attend this educational meeting and symposium. Speakers will cover a range of production, management, and marketing topics. Plans are also being made for a hands-on workshop sessions on Saturday. Details will follow, and registration information will be out in October. For more information, contact Scott Greiner, Virginia Tech, phone (540) 231-9159.

### **Virginia Bred Ewe Sale Scheduled for October 27**

The Virginia Bred Ewe Sale will be held at the Rockingham County Fairgrounds in Harrisonburg, VA on Saturday, October 27, 2001. A quality group of registered Dorset, Hampshire, Southdown, and Suffolk bred yearling ewes and ewe lambs will be offered for sale. Pregnancy diagnosis using ultrasound will be conducted prior to the sale. For more information contact Scott Greiner, Department of Animal Science, Virginia Tech, Blacksburg, VA, 34061. Phone (540) 231-9159.

### **Genetics of Scrapie- Codon 171: Questions and Answers**

**What is scrapie?** Scrapie is a slowly progressive infectious disease of sheep and goats, which causes degeneration of the central nervous system. Early symptoms of scrapie include anxiousness and excitability, with head/neck

tremors and uncoordinated -movement.

Advanced stages of the disease are characterized by progressive weight loss, and intense rubbing and scraping against anything to relieve itching of the skin, as well as uncoordinated movement and violent shaking. Due to a long incubation period (2-5 years), the disease normally affects mature sheep. Scrapie is one of several diseases known as transmissible spongiform encephalopathies (TSE) that affect animals and humans. Bovine Spongiform Encephalopathy (BSE) is a TSE that degenerates the nervous system in cattle. In humans, Creutzfeldt-Jakob disease and Kuru are two known TSE diseases. The prevalence of the disease in the U.S. is very low.

**What causes scrapie ?** Current research supports that scrapie is caused by an infectious protein particle called a prion or prion protein. These scrapie prions appear to have the ability to recruit other normal proteins and induce them to alter their structure to become scrapie prions. This is quite different from other infectious diseases, commonly caused by bacteria or viruses. Scrapie is not a genetic disease.

**How is scrapie transmitted.?** The scrapie agent is most commonly transmitted from an infected ewe to her own or other lambs during the first few months of life. This lateral transmission may occur orally or nasally, as the scrapie agent has been found in various sheep tissues and body fluids including central nervous system tissue and the placenta. The role of environmental contamination with the scrapie agent (feed, water, bedding) is not known. Rams generally do not play a major role in transmission of the disease.

**What is codon 171?** Proteins are manufactured by the joining together of amino acids. Genes

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code for the sequences of amino acids that form a protein. Genes are made up of stretches of DNA, which is the basic hereditary material of organisms. Variations in proteins (amino acid sequences) are coded for by different forms of genes, known as alleles. In the case of scrapie, the amino acid of interest is located at codon 171 (codons are stretches of DNA that code for a single amino acid).

**What are Q and R ?** There are two basic alleles (forms of the gene) at codon 171 that have been found to be related to scrapie susceptibility or resistance. The “Q” allele is known to produce proteins that are susceptible to conversion to scrapie prions. The “R” allele is thought to produce proteins that are not susceptible to this conversion to the scrapie prion (resistant). A sheep will have two copies of the prion gene in each cell. These copies may be the same or different alleles (i.e. “Q” or “R”). Therefore, a sheep may have a genotype of “QQ”, “QR”, or “RR” at codon 171. “QQ” would indicate the sheep has two copies of the “Q” allele, “RR” two copies of the “R” allele, and “QR” one copy of each allele. The genotype of any sheep can be determined from a blood sample.

**So how do “Q” and “R” relate to scrapie susceptibility?** Research has demonstrated that sheep with at least one “R” have increased resistance to scrapie, and sheep with the “QQ” genotype are most susceptible. It is important to recognize that “QQ” sheep are not necessarily carriers of scrapie or infected with the disease. To be a carrier or to acquire the disease, a sheep must be exposed to the scrapie agent (regardless of their genotype). Therefore, genotypes “RR” and “QR” are likely to be more resistant to the scrapie disease than “QQ” sheep if they are exposed.

**How can codon 171 genotypes be used in ram selection?** Keep in mind that a ram will pass on one copy of each chromosome to its offspring. For rams that are

“RR” only “R” sperm will be produced, and for “QQ” rams only “Q” sperm will be produced. Sheep that are “QR” will produce 50% “R” and 50% “Q” sperm. Therefore, “RR” rams will transmit resistance to their offspring 100% of the time (“R” is always passed on), while a “QR” ram will transmit resistance to 50% of its offspring (“R” passed on half the time). A “QQ” ram always transmits a “Q” to its progeny. By knowing the ram’s genotype, the percentage of progeny that will carry resistance can be estimated. This is most relevant if replacement ewe lambs will be kept (development of a resistant ewe flock). If all progeny of the ram will be sold for slaughter, their genotype is of less concern (since they are slaughtered young). Codon 171 is a tool that can be used to breed for sheep that have genetic resistance to the disease. The genotype can be used along with the most economically important traits of growth, reproduction, and maternal traits in selecting rams.

### **Club Lamb Fungus**

#### ***What is club lamb fungus?***

Club lamb fungus is identified by the presence of scaly, usually round lesions on the skin. The lesions are normally found on the head and neck, but can be present on other areas of the body. Club lamb fungus is also referred to as lumpy wool, woolhot, and sheep ringworm. Fungi that grow on tissues with keratin cause these lesions. Signs of the disease include the presence of round lesions, usually around 1 inch in diameter. The lesions are scaly and hairless, and the wool appears matted in affected areas on the body. If the scabs and wool are removed, the lesions are ulcerated and the open sores may be prone to bacterial infection. The disease is most contagious during the scab stage. Dark spots and the regrowth of dark hair in the location of the lesions occur once the disease has healed. The disease is also contagious to humans and other animals. Rubber gloves should be worn when handling infected or suspect animals.

#### ***Prevention, Control, and Treatment***

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Exhibitors should take necessary precautions to avoid their lambs contracting the disease. Show lambs are most susceptible to the disease because frequent washing and shearing removes lanolin from the skin. Lanolin is the sheep's natural protection against the fungus entering the skin. Frequent shearing produces small cuts in the skin that the fungus may infect. The fungus may spread directly from animal to animal, or it may be contracted from contaminated equipment. The fungal spores causing the disease have been known to survive several years in the environment. For these reasons, exhibitors should avoid housing their animals in areas where infected animals have been, or where their sheep may come in contact with infected animals. This would include barns, trailers, scales, and show facilities. The disease may also be contracted from contaminated equipment such as clippers and halters. Show equipment such as towels and blankets should not be shared with other exhibitors. Equipment used on multiple animals such as shearing blades should be disinfected with an antifungal disinfectant. Shearing and washing lambs should be done only when necessary. There is currently no specific treatment for club lamb fungus. The disease will normally run its course in 8 to 16 weeks. Infected animals should be isolated from non-infected animals to prevent spread of the disease. Care needs to be exercised not to cross-contaminate by using separate feeding and show equipment for infected animals. There are several general antifungal medications that can be used as topical and oral treatments for the disease. These drugs may slow down the fungal growth but do not cure the disease. Since these products are not labeled for use in sheep, contact your veterinarian for diagnosis and assistance in the treatment of the disease. If an outbreak of infection does occur, cleaning and disinfecting of facilities and equipment is recommended.

Thank you :

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