



**Glossary of Acronyms and Scientific Terms Used in
Genotyping: A Tool for Controlling Classical Scrapie**

Amino acid: “Building Blocks”. Any of a class of 20 molecules that are combined to form proteins in living things. The sequence of amino acids in a protein and hence protein function are determined by the genetic code. The major amino acids relating to scrapie in the US are:

- **Alanine (A)**
- **Arginine (R)**
- **Glutamine (Q)**
- **Histidine (H)**
- **Lysine (K)**
- **Threonine (T)**
- **Valine (V)**

AMS: Agricultural Marketing Service of USDA

ARS: Agricultural Research Service of USDA

Coagulating: To turn from liquid to a curdlike or jellylike consistency, congeal.

Codon: “Construction Manager”. Genes are made up of **codons**. Each codon instructs the body’s cells to put a specific amino acid at a particular location when building a protein molecule. There are 254 codons in the gene that controls scrapie in sheep.

- **Codon 171** – Is a major determinant of classical scrapie susceptibility.
- **Codon 136** – Affects susceptibility in sheep exposed to some classical scrapie types.
- **Codon 154 & 141** – Plays a minor role in classical scrapie, NOT used for regulatory purposes in the U.S. for classical scrapie, associated with susceptibility to Nor98-like scrapie.

CWD: Chronic Wasting Disease

DNA (Deoxyribonucleic acid): “Engineer.” The genetic material of organisms, usually double-stranded; each unit of DNA is composed of three chemical elements—a nitrogenous base, a phosphate group, and a deoxyribose sugar molecule. This unit is called a nucleotide. DNA is present in all nucleated cells in the body and is passed to subsequent generations in the eggs and sperm of mammalian species. DNA encodes proteins that are composed of chains of amino acids. DNA codes for the amino acid sequence of proteins through sets of three nucleotide bases. Each set of three nucleotide bases is called a codon; each codon codes for one amino acid.

DNA sequence: The relative order of base pairs, whether in a fragment of DNA, a gene, a chromosome, or an entire genome.

DSE: Designated Scrapie Epidemiologist

FTA Card: The use of a paper card impregnated with chemical compounds capable of inactivating biological samples for their safe transport. These cards can inactivate viruses and bacteria, and still preserve the integrity of the organism’s nucleic acids, which can later be used for molecular diagnostic procedures.

Gene: The basic unit of heredity; a sequence of DNA nucleotides on a chromosome.

Geneticist: A scientist who studies genetics.

Genetics: The study of the patterns of inheritance of specific traits.

Genome: All the genetic material in the chromosomes of a particular organism; its size is generally given as the total number of base pairs.

Genotype: The genetic makeup or DNA of an organism.

Heredity: The transmission of characteristics from one generation to the next.

NSEP: The National Scrapie Eradication Program began in September 2001 by USDA/ APHIS/ VS.

NIAA: The National Institute for Animal Agriculture (NIAA), a national trade association for professionals in all sectors of the livestock industry, contracted by USDA /APHIS/VS to conduct the national producer information and education program, "Eradicate Scrapie!" Its scrapie information website is www.eradicatescrapie.org.

Nor98: Non-Classical scrapie was first identified in Norway in 1998, thus the name Nor98.

NVAP: National Veterinary Accreditation Program

PEMMP: Post-Exposure Management and Monitoring Plan, which is the operational part of the Genetics Based Clean-up Plan for infected or exposed flocks issued by USDA/APHIS/ VS late in 2002.

Prevalence: Widespread, generally used.

Prion: "Functional finished product". The term used to describe a small proteinaceous infectious particle. There is still much to be learned about prions, but it is known that they are a factor in scrapie and other TSEs.

PRNP: Prion Protein genes.

PrP^c: A normal cellular *prion protein molecule* produced by the PrNP.

PrP^{sc}: A *scrapie prion protein molecule*, the abnormal infectious form of the prion protein molecule.

TSE: Transmissible Spongiform Encephalopathy, a group of fatal diseases of mammals that causes death by inducing changes in the brain and other central nervous system tissues.

USDA/APHIS/VS: United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS); the federal organization responsible for the scrapie eradication program. Each state has an APHIS/VS office and its staff has the responsibility of working with producers and other interested parties in a state. A list of phone numbers and addresses of these offices can be found at http://www.aphis.usda.gov/animal_health/animal_diseases/scrapie/downloads/designated-epi-list.pdf.

What is the most important thing we need to know about scrapie genetics?

Genotype Susceptibility Combinations

- ◆ AA RR—Sheep which are *resistant*
- ◆ AA QR—Sheep which are *rarely susceptible*
- ◆ AV QR—Sheep which are *much less susceptible*
- ◆ AA QQ—Sheep which are *highly susceptible*
- ◆ AV QQ—Sheep which are *highly susceptible*
- ◆ VV QQ—Sheep which are *highly susceptible*