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College of Veterinary Medicine

VETERINARY CONTINUING EDUCATION



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## Diagnosis of Congenital and Inherited Diseases of Dairy Cattle

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- I. What to do if confronted with a possible congenital/inherited disease problem.
  - A. Contact an interested person for assistance, e.g. Dr. Brad Sequin, George Ruth
    - Most breed associations consult with Dr. Horst Keipold in Kansas
  - B. Report defects to the breed association and/or A.I. center.
- II. Be cautious when using the terms "congenital" and "inherited" or "hereditary."
  - A. Congenital -animal is born with the problem
    - no implication as to cause
    - condition might be hereditary
  - B. Inherited -the genome is involved
    - genetics definitely implicated
- III. Congenital Problems
  - The animal is born with the problem
  - These problems affect the individual animal by affecting the conceptus while it is *in utero*
    - A. Cause might be hereditary
    - B. Non-hereditary causes (teratogens) are numerous and varied.
      1. viruses
      2. plants
      3. nutrients
      4. chemicals

5. local (*in utero*) environmental situations

C. Determination of the cause of congenital problems can be very difficult because there is sometimes only a short period of conceptus susceptibility to the insulting agent (teratogen)

D. Investigation and diagnosis of these is important in order to eliminate the consequences of implicating the breeding stock.

#### IV. Inherited Problems

-Problem may manifest itself at any time after the moment of conception.

-Problems originate in the "genome" due to "lesions" at any of several sites.

##### A. Chromosomes

1. Chromosomal problems are usually manifest as reproductive difficulties.

a. Centric fusion

b. Reciprocal translocations

2. Karyotyping can identify carrier animals and confirm diagnosis in affected animals. [This requires 4 to 5 ml newly drawn heparinized blood held at room temperature--call for more information.]

##### B. Genes

1. Genes give ultimate rise to enzymes (proteins)

2. Disease examples

a. Bovine Leukocyte Adhesion Deficiency (BLAD)

b. Deficiency of Uridine Monophosphate Synthase (DUMPS)

c. Citrullinemia

d. Congenital Porphyria

I have mentioned mainly well-known diseases of Holstein dairy cattle. Other problems exist in them and other breeds have their own problems, e.g.,

**Brown Swiss:** -Progressive degenerative myeloencephalopathy (Weavers)  
-Spinal muscular atrophy  
-Arthrogyrosis

**Guernseys:** -Hypotrichosis  
-Flexural limb deformities

**Jerseys:** -Bilateral osteoarthritis  
-Limber leg  
-Jejununal atresia