

# The Threat of TH and PHA

By Marty Ropp, ASA Director of Field Operations

*A realistic explanation of new and potentially ugly dangers to the genetic health and welfare of the Simmental breed.*



**W**hile the American Simmental Association Board of Trustees wrestles with rules and procedures to identify and guard against the proliferation of two new genetic defects within the Simmental population, it is important that our members be informed and make good decisions to reduce the impacts of these potentially destructive genes.

The defects I am referring to are Tibial Hemimelia, known simply as TH and Pulmonary Hypoplasia with Anasarca also named for its acronym PHA. By far the most frequent and well known of these two lethal genes is TH which is found primarily in cattle of Shorthorn origin. However Maine Anjou, Chianina and our own Simmental populations have individuals which can pass this gene on to their progeny. This gene is always lethal in the homozygous state and the number of carriers in the host populations is substantial.

The gene for PHA also causes death in the homozygous genotype, but is found in far fewer individuals mainly in these same open populations. Currently, there is a gene test available for TH and many individuals have been identified both negative and as carriers. The largest available list of carriers and an in-depth description of the two conditions is available on the American Shorthorn Association web-site [www.short-horn.org](http://www.short-horn.org). This list will grow substantially as Shorthorn begins to move in the direction of mandatory testing.

What does all of this mean to Simmental breeders? It's simple, but it's important. Know the TH and or PHA status of the bulls you are using. Several very highly used club calf sires, already sampled by some of our membership to make percentage cattle, are known carriers of TH. Some have progeny, grand progeny and even great grand progeny registered with the Simmental Association. Know which ones they are, resist using them in the future and test individuals that are potential carriers to clarify their status.

Remember, one half of the individuals sired by these bulls or out of carrier cows are absolutely carriers and the other half are free from the gene. It is as simple as that! Progeny that test free out of carrier parents, however, are of no threat to pass on the defect.

It is, however, difficult to believe that individuals who consider themselves "breeders" would knowingly propagate genes that generate the potential gruesome deformities and mortality associated with these conditions. Most of the carrier bulls are unknowingly used by folks just trying to produce cattle for a specific market. If that is your goal, please take the time to research the bulls you choose to use this spring and use only those free from these genes.

The future also holds new rules and eventual expense for those registering potential carriers in our Simmental herd book. But, because of the available gene test for TH, we do have options regarding the registration of suspect and known carriers that would not exist if no accurate test was available. Further financial burdens on the membership are not something to look forward to, but the threat to our gene

pool and customer base is such that we can ill afford to neglect this or any serious genetic defect for that matter.

We are fortunate in that the majority of the offending individual animals in our herd book originate from a relatively few sires almost all of which are being used to produce club calves and not mainstream commercial progeny. If, however we are not diligent about identifying and reducing the frequency of these genes in our members' herds, all Simmental breeders will eventually suffer.

## ASA Policy for Monitoring Tibial Hemimelia (TH) Effective April 1, 2006

1. ASA will pay to test, at least, the top 50 sires based on the number of progeny reported in the previous calendar year and thereafter any new sire entering the top 50 sires list.
2. **Progeny** out of registered suspect parents, will not receive registration until the suspect parent is DNA tested for both TH and parental validation (fees are responsibility of owner).
3. **A suspect parent** is an animal who:
  - a) is out of a TH carrier and has not been tested free, or
  - b) is registered with ASA, not been TH tested, and has 1/8 or more Shorthorn, Maine Anjou or Chianina blood.

The American Simmental Association has made testing arrangements with AgriGenomics, Inc., the only lab offering DNA evaluation for the presence of TH. The following outlines ASA members' options for testing:

- Contact either ASA or AgriGenomics and make arrangements to send samples for TH testing (\$27 per sample).
- Unless the AgriGenomics order includes sending the DNA sample on to Igenity (ASA's official lab for parental validation, \$45 per sample), the results of the AgriGenomics sample will not satisfy ASA's policy to clear progeny of suspect parents for registration.
- If you order the sample to go on to Igenity for parental validation, all progeny of this parent (sire or cow) can receive a registration certificate.
- Progeny will receive registration certificates regardless of the TH status of the parent (THC = carrier, and THF = free).
- Progeny of THF parents require no further testing.
- Progeny of THC parents will be required to complete the above process when their progeny are registered.
- ASA will denote TH status on official documents.

**AgriGenomics, Inc.**  
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