

American Angus Association®

Osteopetrosis (OS)

Fact Sheet

ANGUS
THE BUSINESS BREED

The following fact sheet was developed to respond to questions commonly asked by American Angus Association members.

Additional information may be found online at www.angus.org.

What is Osteopetrosis (OS)?

Osteopetrosis, more commonly known as Marble Bone disease, is a genetic condition in the Angus population and is inherited as a simple recessive. Affected calves are born dead or die shortly after birth, usually 10 to 30 days premature. The body can be small, and a shortened (undershot) lower jaw with impacted molars may be present. Bones are solid and do not have a normal bone marrow cavity, making them brittle and easily shattered. Follow this link for visuals of the disease: <http://bmcbgenomics.biomedcentral.com/articles/10.1186/1471-2164-11-337>.



What causes OS?

OS is caused by a recessive mutation on a single cattle chromosome. Cattle homozygous for the mutated gene will exhibit OS.

What is an OS carrier?

An OS carrier is an Angus or Angus-cross cow, heifer, bull or steer carrying the recessive OS mutation in their DNA.

Why are carriers of OS important?

Carriers of OS used in breeding programs (registered or commercial) are responsible for propagating the recessive mutation within the cattle population.

What does an OS carrier look like?

An OS carrier looks perfectly normal. These animals do not differ in physical appearance indicating an OS carrier status.

If a cow has an OS calf, what does that mean?

If a cow has a natural-born OS calf, it means both the dam and the sire of the calf are carriers of the OS mutation.

If a recipient cow has an OS calf, what does that mean?

If a recipient cow has an OS calf, it means only that both the donor cow and the sire of the calf are carriers of OS. It does not tell you anything about the OS carrier status of the recipient cow.

If a bull sires an OS calf, what does that mean?

If a bull sires an OS-affected calf, it means both the sire and the dam of the calf are carriers of the OS mutation.

I have never had an OS calf. Does that mean my cows are non-carriers?

Not necessarily. It just means you have not mated both a carrier dam and carrier sire together resulting in an OS-affected calf.

What is the risk of having an OS calf if I breed an OS carrier cow to an OS carrier bull?

Every time you breed a carrier to a carrier, there is:

- A 25% risk of having a dead OS-affected calf;
- A 50% risk of having an otherwise normal-appearing calf that carries the OS mutation;
- A 25% chance that you will have a normal-appearing, non-carrier calf.

If I breed an OS carrier cow to an OS carrier bull and have three live calves, will the fourth calf have OS?

The risk is the same every time you breed a carrier to a carrier. There is always a 25% risk of having a dead OS calf, a 50% risk of having a carrier calf, and a 25% chance of having a non-carrier calf.

If I breed an OS carrier cow to a non-carrier bull, what is the chance of having an OS affected calf?

Zero. You will never have an OS affected calf if you breed a carrier cow to a non-carrier bull (excluding the possibility of a spontaneous mutation).

If I breed an OS carrier cow to a non-carrier bull, what is the risk of having a carrier calf?

Every time you breed a carrier cow to a non-carrier bull there is:

- A 50% risk of having a normal-appearing calf that carries the OS mutation; and
- A 50% chance you will have a non-carrier calf.

Is there a test to identify OS carriers?

Yes. A DNA test is available to determine if an animal carries the OS mutation in their DNA. The type of DNA sample required to perform the test varies from lab to lab but includes: hair root samples, blood-spot or FTA cards, whole blood in "purple-top" tubes, tissue samples from ears and semen samples. A video on www.angus.org explaining how to collect the sample can be found [here](#).

What do I do with the confirmed non-carrier females in my herd?

If the females are tested non-carriers and they are bred to non-carrier bulls, they will never produce affected OS calves or carriers. These non-carrier females can be used throughout your breeding program with no risk of propagating the OS mutation.

What do I do with confirmed female carriers in my herd?

You have several options:

- If you have a cow that carries the OS mutation and you want to produce calves from her; you must make a commitment to test all offspring retained for breeding; (check policy regarding registration requirements)
- If you have both a registered and a commercial herd, retain your carrier cows in the commercial herd, breed to a non-carrier bull, and test any calves retained for breeding purposes;
- If you always breed your carrier cows to a non-carrier bull, you will never have an OS calf.
- Use your OS carrier cows as ET recipients. As a recipient female, she has no genetic effect on the embryo calf she raises.

OS potential carrier report & potential carrier management tool

AAA Login users can access interactive tools to generate a report of owned animals and their Osteopetrosis (OS) status based on the OS test results received to date. From the AAA Login menu, go to Manage Herd, DNA, Order Tests and choose "Potential Carrier Report AM/NH/CA/OS/DD/M1/D2/OH" or "Potential Carrier Management Tool (PCMT)." The PCMT can identify those animals in your herd that have the most descendants in your herd and would be the most logical animal to start a testing scheme should you decide to test for a particular genetic condition. If you are not a current AAA Login user, you can sign up to create an online profile at www.angusonline.org.

What is the AAA registration policy regarding OS?

	If a calf is a potential carrier submitted for registration after 5-17-2016.
Heifers	Must be tested and can be registered regardless of the test outcome.
Bulls	Must be tested and only those that test OSF can be registered.
E.T. Calves	Registration is based on sex of calf and if they are sired by a bull that is an A.I. sire as described below.
Steers	No test required.
A.I. Sires that are confirmed carriers	Calves cannot be registered that are conceived more than 60 days after the date a non-owned bull (a bull that would require an A.I. Service Certificate) is listed as a carrier animal (OSC).
Definitions	OSC – OS Carrier, has been tested and carries the OS mutation. OSF – OS Free, has been tested and does not carry the OS mutation. OSP – OS Potential Carrier, animal that traces to one or more confirmed tested carrier animals in its pedigree that have no intervening ancestors that have been tested free of OS.

Testing Options

Submit Samples through American Angus Association/AGI

AGI partners with approved laboratories to provide testing for this genetic condition. Use [AAA Login](#) to order tests. Log in at www.angusonline.org and use menu option: Manage Herd, DNA, Order Tests; or call 816.383.5100 for questions. Samples are submitted to the American Angus Association and archived for future testing requests.

