

Oculocutaneous Hypopigmentation (OH)



A new genetic condition, Oculocutaneous Hypopigmentation (OH) was recognised at the recent meeting of the Angus Australia Board of Directors on May 21st, 2016.

The recognition of OH is largely to maintain consistency with the genetic conditions recognised by other registered Angus breed organisations internationally. **It is not anticipated that Angus Australia members will need to take any action, but should remain vigilant to the existence of this genetic condition.**

What is OH?

OH is a non-lethal genetic condition and is largely cosmetic in nature. Affected calves have eyes with irises that are pale blue around the pupil with a tan periphery. Their hair coats have a slightly bleached color. While some affected calves have sensitivity to light, they are believed to be otherwise normal functionally and physiologically.

Photos of animals affected by OH are displayed below.

Although two separate genetic conditions, OH exhibits very similar characteristics to another genetic condition recognised by Angus Australia, Heterochromia Irides or "HI" (also known as "white eye").

Background

Oculocutaneous Hypopigmentation was originally reported to the American Simmental Association (ASA) in 2012, where a calf was reported with "white coloured eyes and a diluted hair coat". Over the next two years, three additional calves were reported to the ASA with similar characteristics.

As all the appropriate DNA samples had been collected and stored, an investigation was conducted and identified the abnormalities were a result of a genetic mutation. Subsequent DNA testing identified that the mutation was most likely introduced into the Black Simmental breed from Angus cattle during the development of black purebreds.

Initial testing of 1,200 Angus animals in the US identified one sire, Sir WMS Warrant (DOB 5/7/1978), as being a carrier of OH. 9 bulls and 14 cows are now listed as being carriers on the AAA website.

Of these, Sir WMS Warrant remains the only known carrier recorded with Angus Australia, with the carrier frequency within the Australian Angus population estimated to be extremely low (0.5% or 1 in 200 animals).

There have been no cases of OH reported in Australia to date.



The first reported Simmental heifer calf.



The same animal as an adult, with her own unaffected calf. Note the unusual chocolate coat color.



A closeup. Note the light-colored irises.

* Photos courtesy of American Simmental Association, SimTalk, January 2016

Management of OH

Given the cosmetic nature and minimal economic impact of the genetic condition, coupled with the likely low frequency of carrier animals within the Australian Angus population, it is not anticipated that Angus Australia members will need to undertake any genetic testing to identify carrier animals, but should remain vigilant to the existence of the genetic condition.

DNA tests have however been made available from both the University of Queensland and Zoetis for any members that may wish to test individual animals. Consistent with Angus Australia's genetic condition policy, results of any tests that are conducted will be displayed on the Angus Australia website, and should be fully disclosed in any marketing material.

Unless circumstances change, a gene probability analysis will not be conducted for OH.

How is OH Inherited?

OH has a simple autosomal recessive mode of inheritance, meaning:

- Animals will only be affected by the condition if they carry two copies of the genetic mutation, with one copy inherited from their sire and one from their dam.
- Animals carrying one copy of the genetic mutation are known as "carrier" animals, and will be completely unaffected by the condition, appearing as normal animals. Carrier animals will pass on the genetic mutation to 50% of their progeny, with the remaining 50% of their progeny inheriting normal DNA.

Mating Outcomes

The table below illustrates the OH status of progeny when mating sires and dams of differing OH status together.

		OH Status (Sire)		
		Free	Carrier	Affected
OH Status (Dam)	Free	100% Free	50% Free 50% Carrier	100% Carrier
	Carrier	50% Free 50% Carrier	25% Free 50% Carrier 25% Affected	50% Carrier 50% Affected
	Affected	100% Carrier	50% Carrier 50% Affected	100% Affected

For example, if a carrier sire is mated to a carrier dam, 25% of calves will be free of the OH genetic mutation (i.e. will inherit completely normal DNA), 50% of calves will be unaffected by the genetic condition (i.e. will be perfectly normal) but will be carriers of the OH genetic mutation, and 25% of calves will be affected by OH.

Further Information

To further discuss the OH genetic condition, please contact Angus Australia's Breed Development & Extension Manager, Andrew Byrne on (02) 6773 4618 or andrew@angusaustralia.com.au.

Additional information regarding the management of genetic conditions is also available from the Angus Australia website (www.angusaustralia.com.au).