



VETERINARY GENETICS LABORATORY
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CATTLE GENETIC MARKER REPORT

<p>SARAH FLEMING 221 HOPE LN DUNLAP, TN 37327</p>	<p>Case: NC49373 Date Received: 26-Nov-2018 Print Date: 07-Dec-2018 Report ID: 4829-0792-6994-9144 Verify report at www.vgl.ucdavis.edu/myvgl/verify.htm</p>
<p>Name: HCC SAMUEL Reg: pending DOB: 11/17/2018 Sex: Male Breed: Mini-Mid Jerseys</p>	

ANALYSIS

Permanent Record.

GENETIC MARKERS

LOCUS	TYPE	LOCUS	TYPE	LOCUS	TYPE
BM1818	264/266	BM1824	180/182	BM2113	125/137
BRR	248/258	CYP21	187/198	ETH003	117
ETH10	217/221	ETH225	144/150	INRA23	206
RM006	110/118	RM067	90/102	SPS115	252
TGLA122	143/149	TGLA126	117	TGLA227	95
TGLA53	170/176				



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MILK PROTEIN DNA TEST REPORT

SARAH FLEMING 221 HOPE LN DUNLAP, TN 37327	Case: NC49373 Date Received: 26-Nov-2018 Print Date: 07-Dec-2018 Report ID: 3453-5602-8206-2033 Verify report at www.vgl.ucdavis.edu/myvgl/verify.htm
Name: HCC SAMUEL Reg: pending DOB: 11/17/2018 Sex: Male Breed: Mini-Mid Jerseys	

Beta Casein	Kappa Casein	Beta Lactoglobulin
A2/B	B/B	B/B

In the A2C nomenclature for A2 genotyping, the Beta Casein above corresponds to A1/A2.

Beta Casein (A2 Genotyping)* - milk yield and protein content. The A2 variant has been shown to have a positive association with milk yield and protein content. The expanded beta casein test reflected in this report detects variants A1, A2, A3, B, C, D, E, F, G, H1, H2, I, K and L.

Based on the amino acid present in position 67 these variants can be classified into 2 groups - A1 and A2. Variants in the A1-group (Histidine) are A1, B, C, F and G. Variants in the A2-group (Proline) are A2, A3, D, E, H1, H2, I, K and L. The levels of bioactive peptide beta-casomorphin 7 (BCM7) produced from the metabolism of beta casein is several-fold higher for variants in the A1 group than in the A2 group. Higher levels of BCM7 have been associated with negative health effects in humans. Relative to levels of BCM7 production, variants within each group behave similarly but may differ in other properties.

Kappa Casein - protein yield and percentage. The A variant and AA genotype are associated with higher milk production. The B variant and BB genotype are associated with increased milk protein and casein content, and better cheese yield. Relative to protein content and cheese production, BB is the most favorable genotype, AB is intermediate and AA is the least favorable.

Beta Lactoglobulin - milk yield and whey protein content. The A variant is associated with increased milk yield and whey protein content. The B variant is associated with increased casein and fat content and is favorable for cheese production.

* The beta casein test was redesigned by the VGL to detect other known variants and improve resolution of the A2 genotyping test. This change applies to all samples tested since December 9, 2016. For more information, please see <https://vgl.ucdavis.edu/services/A2Genotyping.php>

VGL is an A2 Corporation Limited (A2C) accredited and registered A2 Gene Tester. A2C owns various intellectual property rights (including patent rights, trademarks, and technical and commercial know how) relating to the commercial production and sale of a2™ branded milk or milk with reduced beta casein A1. It is possible that commercial use of test results may fall within the scope of such intellectual property rights, so if you intend to form a herd of animals used to produce a2™ branded milk or milk with reduced beta casein A1 on a commercial scale, you should contact A2C for more information.

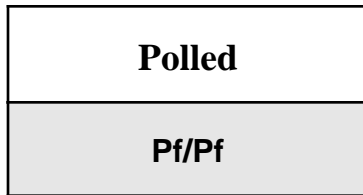


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CATTLE POLLED TEST RESULTS

SARAH FLEMING 221 HOPE LN DUNLAP, TN 37327	Case: NC49373 Date Received: 26-Nov-2018 Print Date: 07-Dec-2018 Report ID: 4000-4445-4898-8144 Verify report at www.vgl.ucdavis.edu/myvgl/verify.htm
Name: HCC SAMUEL Reg: pending DOB: 11/17/2018 Sex: Male Breed: Mini-Mid Jerseys	



Result Codes:

- H/H** HORNED. No copies of either Polled molecular marker are present.
- Pf/H** POLLED. One copy of the Polled-Friesian molecular marker is present. At least 50% of the offspring will be polled.
- Pf/Pf** POLLED. Two copies of the Polled-Friesian molecular marker are present. All offspring will be polled.
- Pc/H** POLLED. One copy of the Polled-Celtic molecular marker is present. At least 50% of the offspring will be polled.
- Pc/Pc** POLLED. Two copies of the Polled-Celtic molecular marker are present. All offspring will be polled.
- Pc/Pf** POLLED. One copy of Polled-Celtic and 1 copy of Polled-Friesian molecular markers are present. All offspring will be polled.