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Wool

# Genetic Regulation of Melanin Synthesis

Produced for the CRC for Premium Quality Wool undergraduate program by;  
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# Agouti gene in sheep

Name	Allele	Phenotype
White/tan	$A^{wt}$	Uniformly white (Merinos)
Non-agouti	$A^a$	Black self-colour sheep
Badgerface	$A^b$	White with black belly, legs, eyes, ears
Reserve badgerface	$A^w$	Black sheep with white markings
White type	$A^+$	Brown body, black stripes, pale belly, saddle, muzzle

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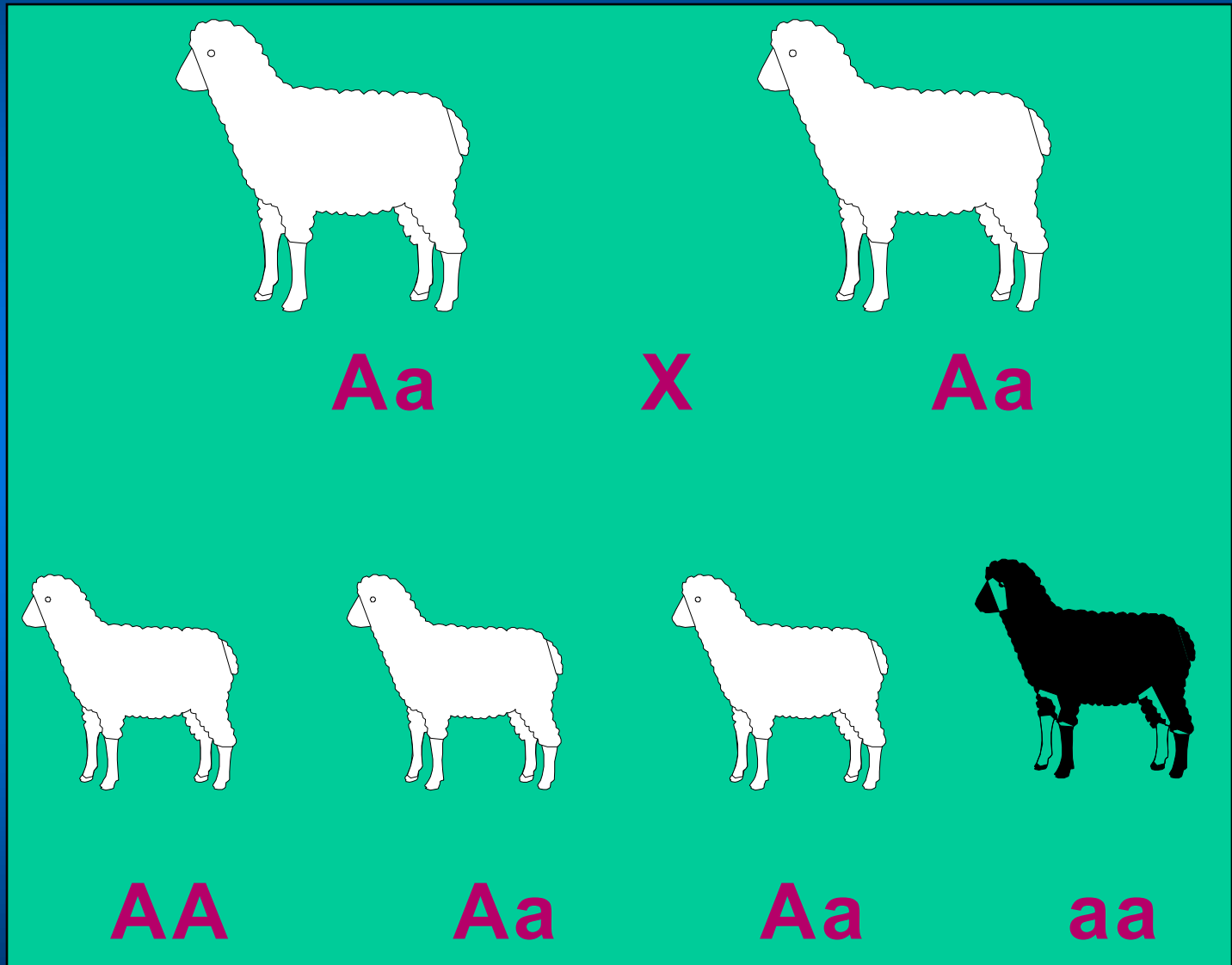
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# Non-agouti: recessive gene defect



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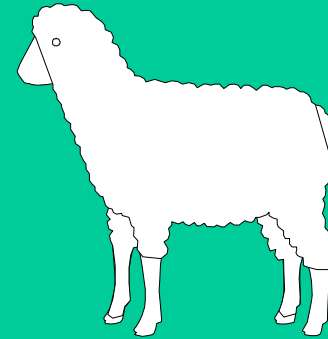
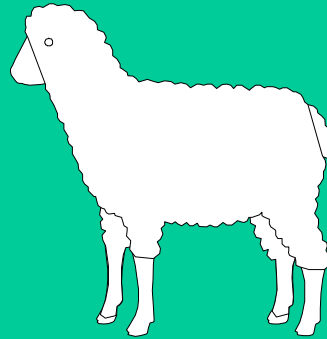
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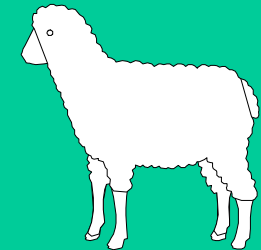
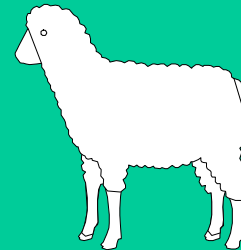
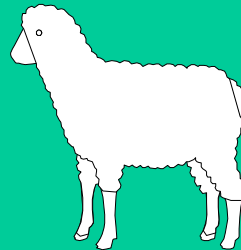
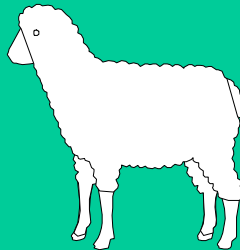
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# Spread of a recessive gene defect



**Carrier ram Aa X Ewes AA**



**Aa**

**Aa**

**AA**

**AA**

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# Extension Gene in Sheep

Locus/allele	Symbol	Action of gene product
<b>EXTENSION</b>	<b>E</b>	<b>MSH receptor</b>
wild type	$E^+$	White (Merinos) or tan
<b>Dominant black</b>	$E^u$	<b>Black sheep, MSH-R. Always activated</b>
<b>(Suffolk)</b>	$E^j$	<b>Black lambs, fleece; wool is white in adults</b>

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# Tyrosinase gene in sheep

Locus/allele	Symbol	Action of gene product
ALBINO	C	Tyrosinase (pigment forming enzyme)
albino	C <sup>c</sup>	Pink eyes, no dark fibres
Albino marrabel	C <sup>ccmar</sup>	Blue eyes, white/light wool in Suffolk
Wild type	C <sup>+</sup>	Dark eyes, black/brown sheep if non-agouti, Normal white Merinos

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# Brown (Moorit) sheep gene

Locus/allele	Symbol	Action of gene product
<b>BROWN</b>	<b>B</b>	<b>Tyrosinase-related protein-1 or 2. Enzyme in melanin synthesis</b>
<b>Wild (black)</b>	<b>B<sup>-</sup></b>	<b>Oxidized DHICA produced</b>
<b>brown</b>	<b>B<sup>b</sup></b>	<b>If also non-agouti, wool is brown not black</b>

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