

**Country**                      **Australia**

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<b><u>Trait category:</u></b>	<b><u>Individual trait(s):</u></b>
<b>Reproduction-calving</b>	<b>Calving performance (direct)</b>
<b>Workability</b>	<b>Milking speed</b>
	<b>Temperament</b>
	<b>Likability</b>
<b>Conformation</b>	<b>Udder</b>
	<b>Locomotion</b>
	<b>Other</b>
<b>Longevity</b>	<b>Survival</b>

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<b>Reproduction calving traits</b>	<b>Calving performance (direct)</b>
<b>Breed(s)</b>	Holstein-Friesian
<b>Trait definition and unit(s) of measuring</b>	Scored in 3 categories; unassisted (1), assisted (2), difficult (3)
<b>Method of measuring and collecting data</b>	Scored by farmer and collected by Milk Recording Bodies
<b>Time period for data inclusion</b>	Since 1975
<b>Age groups</b>	2 <sup>nd</sup> calf and older
<b>Genetic parameters</b>	$h^2_{\text{calving performance (direct)}} = 0.05$
<b>Sire categories</b>	AI-sires
<b>Environmental effects pre-adjustment evaluation model</b>	None Herd x year x season, age at calving
<b>Base for age adjustment</b>	None
<b>Use of genetic groups and/or relationships</b>	Relationship matrix with sires and MGS
<b>Method (model) of genetic evaluation</b>	ST BLUP Sire-MGS model
<b>System validation</b>	Range checks on data
<b>Expression of proof</b>	Expected percentage difficult calvings when mated to average mature cows
<b>Genetic (reference) base</b>	Fixed, average EBV of sires with proofs in 1990
<b>Criteria for official publication of sire proofs</b>	≥ 60 effective daughters in 15 herds
<b>Number of evaluations/publications per year</b>	One; May
<b>Use in total merit index</b>	No
<b>Key reference on methodology applied</b>	-

<b>Workability traits</b>	<b>Milking speed Temperament Likability</b>
<b>Breed(s)</b>	Holstein-Friesian, Jersey, Illawara
<b>Trait definition and unit(s) of measuring</b>	Milking speed is scored from fast (1) to slow (5) Temperament in the milking parlor is scored from docile (1) to agitated (5) Likability is the answer of the question: "All things being equal, would you like more cows like this one in your herd?" Scored from strongly yes (1) to strongly no (5)
<b>Method of measuring and collecting data</b>	Scored by farmers and collected by Milk Recording Bodies
<b>Time period for data inclusion</b>	Since 1980
<b>Age groups</b>	Heifers with maximum age at calving of 42 months
<b>Genetic parameters</b>	$h^2_{\text{milking speed}} = 0.25$ $h^2_{\text{temperament}} = 0.16$ $h^2_{\text{likability}} = 0.20$
<b>Sire categories</b>	AI-sires
<b>Environmental effects pre-adjustment evaluation model</b>	None Herd x year x season, age at calving
<b>Base for age adjustment</b>	None
<b>Use of genetic groups and/or relationships</b>	Relationship matrix with sires and MGS
<b>Method (model) of genetic evaluation</b>	ST BLUP Sire-MGS model
<b>System validation</b>	Range checks on data
<b>Expression of proof</b>	Percentage expected satisfactory daughters (linear scored as 1, 2 or 3) following mating to average cows. The EBV for percentage satisfactory daughters is determined by relating the known distribution of raw scores to the (internal) EBV based on the 5 linear categories.
<b>Genetic (reference) base</b>	Fixed, average EBV of sires with proofs in 1990
<b>Criteria for official publication of sire proofs</b>	$\geq 25$ effective daughters in 15 herds
<b>Number of evaluations/publications per year</b>	One; May
<b>Use in total merit index</b>	No
<b>Key reference on methodology applied</b>	Beard, K. 1993. Genetic evaluation for milking speed, temperament, likability and survival in Australia. Proceedings of Interbull Annual Meeting Aarhus Denmark. August 1993, Interbull Bulletin No. 8

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<b>Conformation traits</b>	<b>Udder:</b>	udder texture, udder depth, fore attachment, rear attachment height, rear attachment width, centre ligament, teat placement, teat length, mammary overall
	<b>Locomotion:</b>	foot angle, rear set
	<b>Other:</b>	stature, bone quality, angularity, muzzle width, body length, body depth, chest width, rump length, pin width, pin set, loin, type overall

<b>Breed(s)</b>	Holstein-Friesian, Jersey, Illawara
<b>Trait definition and unit(s) of measuring</b>	Most traits are scored on a linear 1-9 point scale, except for mammary and type overall, which are scored on a linear 1-15 point scale
<b>Method of measuring and collecting data</b>	Scored by official classifiers of breed society
<b>Time period for data inclusion</b>	Since 1980
<b>Age groups</b>	Heifers with maximum age at calving of 42 months
<b>Genetic parameters</b>	$h^2_{\text{udder traits}} = 0.17 \text{ to } 0.33$ $h^2_{\text{locomotion traits}} = 0.10 \text{ to } 0.20$ $h^2_{\text{other traits}} = 0.17 \text{ to } 0.45$
<b>Sire categories</b>	AI-sires and registered NS-sires
<b>Environmental effects pre-adjustment evaluation model</b>	None Herd x season x classifier, age at classification, stage of lactation
<b>Base for age adjustment</b>	None
<b>Use of genetic groups and/or relationships</b>	Relationship matrix with sires and MGS
<b>Method (model) of genetic evaluation</b>	ST BLUP Sire-MGS model
<b>System validation</b>	Range checks on data
<b>Expression of proof</b>	EBV in units in which the traits are measured (no standardization)
<b>Genetic (reference) base</b>	Fixed, average EBV of sires with proofs in 1990
<b>Criteria for official publication of sire proofs</b>	$\geq 15$ effective daughters in 5 herds
<b>Number of evaluations/publications per year</b>	One; May
<b>Use in total merit index</b>	No
<b>Key reference on methodology applied</b>	-

Longevity traits	Survival
<b>Breed(s)</b>	Holstein-Friesian, Jersey, Illawara
<b>Trait definition and unit(s) of measuring</b>	Percentage surviving from one year to the next. Survival is measured as a binomial trait where a cow is considered to have survived if she has the opportunity to be present in the herd, and is present, one year after she calved
<b>Method of measuring and collecting data</b>	Calculated from production records
<b>Time period for data inclusion</b>	Since 1980
<b>Age groups</b>	All
<b>Genetic parameters</b>	$h^2_{\text{survival}} = 0.025$
<b>Sire categories</b>	AI-sires
<b>Environmental effects pre-adjustment evaluation model</b>	None Herd x year x season
<b>Base for age adjustment</b>	None
<b>Use of genetic groups and/or relationships</b>	Relationship matrix with sires and MGS
<b>Method (model) of genetic evaluation</b>	ST BLUP Sire-MGS model, each parity is evaluated separately. The evaluations are then pooled across parities
<b>System validation</b>	Range checks on data
<b>Expression of proof</b>	Deviation from the average expected percentage survival of future daughters (an EBV of +10 for a bull means 5% more daughters in the herd are expected to be in the herd next year, compared to an average bull)
<b>Genetic (reference) base</b>	Fixed, average EBV of sires with proofs in 1990
<b>Criteria for official publication of sire proofs</b>	≥ 50 effective daughters in 15 herds
<b>Number of evaluations/publications per year</b>	One; May
<b>Use in total merit index</b>	No
<b>Key reference on methodology applied</b>	Beard, K. 1993. Genetic evaluation for milking speed, temperament, likability and survival in Australia. Proceedings of Interbull Annual Meeting Aarhus Denmark. August 1993, Interbull Bulletin No. 8