Form GE

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DESCRIPTION OF NATIONAL GENETIC EVALUATION SYSTEMS

Country (or countries)	NZL
Main trait group[1]	Production
Breed(s)	BSW, GUE, HOL, JER, RDC
Trait definition(s) and unit(s) of measurement[2]	Milk (l), Milkfat (Kg), Protein (Kg)
Method of measuring and collecting data	Milk recording system with four record types: morning-plus-evening-recorded (AM+PM) once-per-day milking (OAD) morning-only-recorded (AM_only) evening-only-recorded (PM_only)
Time period for data inclusion	Test day records since June 1986
Age groups (e.g. parities) included	2 years, 3 years, 4 years, 5-7 years
Other criteria (data edits) for inclusion of records	Include all test day records obtained in the interval from 3 days after calving to 270 days after calving.
Criteria for extension of records	Not applicable
Sire categories	All bulls including domestic and foreign AI bulls plus natural service herd sires
Environmental effects[3]**, pre-adjustments**	Pre-adjust OAD, AM_only, and PM_only test day records to common variance with AM+PM test day records
Method (model) of genetic evaluation[3]	ST-ML-RR-TD-BLUP-Animal Model
Environmental effects[3] **in the genetic evaluation model**	**F:** HYS-record type-test date; Induced calving; Age at calving within breed; heterosis; Stage of Lactation at test day. **R:** Lactation curve for PE
Adjustment for heterogeneous variance in evaluation model	None
Use of genetic groups and relationships	Genetic groups were assigned by breed, gender of missing parent, birth year and country of origin. Four breed classes were assigned genetic grouping: HOL, JER, RDC, and other breeds. Genetic groups were assigned in 5 year intervals from 1960 to 1980 then yearly, with the first birth year group being prior to 1960. Country of origin was defined as NZL, North American and Other. If a genetic group had fewer than 200 animals per group, birth years were clustered. No clustering occurred across breed, origin or gender genetic groups.
Blending of foreign/Interbull information in evaluation	For the test evaluation, breeding values are based on national information only.
Genetic parameters in the evaluation	h^2 (pooled) : Milk 0.36; Fat 0.33; Protein 0.31
System validation	Interbull trend validation test III
Expression of genetic evaluations	$EBV_{Age\ Group}$ is calculated as the sum of DIM EBV from day 3 to day 270. Reported EBV is the average of the four age group EBVs.

Definition of genetic reference base	2000 born cows of all breeds and crosses with records for each of milk, fat, protein and 17 traits other than production in 2002.
Next base change	June 2016
Calculation of reliability	Information source method. Harris, B.L. and Johnson, D.L. (1998) *J Dairy Sci* **81**:2723-2728; the method is extended for multi-trait evaluation in *25 Jan 2005 Somatic Cell Score Testday Model for National Genetic Evaluation* at www.aeu.org.nz/page.cfm?id=59
Criteria for official publication of evaluations	All evaluations are official for bulls enrolled for the evaluation system
Number of evaluations / publications per year	14
Use in total merit index[4]	The total merit index is called Breeding Worth (BW). In 2011, relative emphasis in percentage terms (VanRaden, 2002, 7th World Congress on Genetics Applied to Livestock Production, Communication No 01-21) was respectively 12, 39, 15, 14, 7.5, 6.5, 6 for Milkfat, Protein, Milk (-), Liveweight (-), Cow Fertility, Somatic Cell Score (-) and Residual Survival not genetically associated with other traits in the index.
Anticipated changes in the near future	Not applicable
Key reference on methodology applied	B.L. Harris, A.M. Winkelman, D.L. Johnson and W.A. Montgomerie (2006). Development of a national production testday model for New Zealand. Interbull Bulletin **35**: 27-30
Key organisation: name, address, phone, fax, e-mail, web site	DairyNZ Jeremy Bryant Private Bag 3016 Hamilton NEW ZEALAND Phone: +64 (0)21 814 163 jeremy.bryant@dairynz.co.nz Website: http://www.dairynz.co.nz/animal/animal-evaluation/

1) Either: Production (e.g. milk, fat, protein), Conformation, Health (e.g. mastitis resistance, milk somatic cell, resistance to diseases other than mastitis), Longevity, Calving (e.g. stillbirth, calving ease), Female fertility (e.g. non-return rate, interval between reproductive events, number of AI's, heat strength), Workability (e.g. milking speed, temperament), Beef production, Efficiency (e.g. body weight, energy balance, body conditioning score), or Other traits.
2) Indicate frequencies per category if the trait is categorical and specify transformation of data if practiced.
3) Use abbreviations for most common effects (see document with list of abbreviations at http://www-interbull.slu.se/service_documentation/General/list_of_abbreviations.rtf) and indicate random (R) or fixed (F).
4) Please give economic weights and indicate how they are expressed (preferably in genetic standard deviation units).

Parameters used in genetic evaluation

Country (or countries): NZL
Main trait group: Production
Breed (repeat as necessary): BSW, GUE, HOL, JER, RDC

Trait	Definition	ITB[a]	h^{2b}	genetic variance[b]	official proof standardisation formula[c]
Milk	Pooled	X	0.359	108403	
Fat	Pooled	X	0.326	184.7	
Protein	Pooled	X	0.306	93.1	
Milk	First parity		0.361	77846	
Milk	Second parity		0.359	102963	
Milk	Third parity		0.361	131396	
Milk	Later parities		0.355	148525	
Fat	First parity		0.336	133.4	
Fat	Second parity		0.327	174.3	
Fat	Third parity		0.325	221.4	
Fat	Later parities		0.317	257.4	
Protein	First parity		0.308	66.8	
Protein	Second parity		0.306	89.7	
Protein	Third parity		0.306	111.8	
Protein	Later parities		0.304	131.8	

[a] Indicate, with X, traits that are submitted to Interbull for international genetic evaluations.
[b] If repeated records are treated as separate traits, provide heritability estimates and genetic variances separately for each trait, as well as for all traits pooled, i.e. for the trait submitted to Interbull.
[c] Expressed as follows:
StandEval=((eval-a)/b)*c+d where a=mean of the base adjustment, b=standard deviation of the base, c=standard deviation of expression (include sign if scale is reversed), and d=base of expression.

Parameters for national genetic evaluations for production traits as provided to Interbull

Country (or countries): NZL
Main trait group: Production
Breed(s): BSW, GUE, HOL, JER, RDC

Trait	h^{2a}	genetic variance[a]	official proof standardisation formula[b]
Milk yield:	0.359	108403	
Fat yield:	0.326	184.7	
Protein yield:	0.306	93.1	

[a] If lactations, or part of lactations, are treated as separate traits, provide heritability estimates and genetic variances separately for each lactation, as well as for all lactations pooled, i.e. for the trait submitted to Interbull.

[b] Expressed as follows:
StandEval=((eval-a)/b)*c+d where a=mean of the base adjustment, b=standard deviation of the base, c=standard deviation of expression (include sign if scale is reversed), and d=base of expression.