

Appropriate selection indices for functional traits in dairy cattle breeding schemes

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Short title: Selection indices for functional traits

Supplementary File

1.This research is a part of Ph.D. thesis of the first author.

Table S1. Expected genetic and economic (in parentheses) gains for different traits in breeding goal using different indices (based on 200 progenies per sire)

Index no.	Milk	Protein	Fat	DFS	CI	Mast	SCS	TR
1	256.892 (51.378)	6.751 (-6.886)	4.582 (6.232)	1.091 (-2.182)	3.315 (-8.287)	0.022 (-1.760)	0.006 (-0.216)	38.278
2	254.701 (50.940)	6.743 (-6.878)	5.265 (7.160)	1.182 (-2.364)	3.699 (-9.248)	0.023 (-1.840)	0.003 (-0.108)	37.663
3	253.862 (50.772)	6.524 (-6.654)	5.303 (7.212)	1.158 (-2.316)	3.702 (-9.255)	0.023 (-1.840)	0.004 (-0.144)	37.775
4	224.542 (44.908)	5.632 (-5.745)	3.912 (5.320)	-0.757 (1.514)	-1.626 (4.065)	0.013 (-1.040)	-0.014 (0.504)	49.527
5	251.333 (50.267)	6.387 (-6.515)	5.114 (6.954)	0.547 (-1.093)	2.277 (-5.693)	0.022 (-1.760)	0.001 (-0.036)	42.124
6	204.040 (40.808)	5.041 (-5.142)	3.383 (4.601)	-1.363 (2.726)	-3.075 (7.688)	0.011 (-0.880)	-0.017 (0.612)	50.413
7	253.752 (50.750)	6.553 (-6.684)	5.309 (7.220)	1.114 (-2.228)	3.495 (-8.737)	0.022 (-1.760)	0.002 (-0.072)	38.489
8	253.233 (50.647)	6.582 (-6.714)	5.382 (7.319)	1.106 (-2.212)	3.450 (-8.625)	0.022 (-1.760)	0.000 (0.000)	38.655
9	252.778 (50.556)	6.605 (-6.737)	5.385 (7.324)	1.059 (-2.118)	3.231 (-8.078)	0.021 (-1.680)	-0.002 (0.072)	39.339
10	198.042 (39.608)	4.915 (-5.013)	3.252 (4.423)	-1.469 (2.938)	-3.463 (8.658)	0.009 (-0.720)	-0.019 (0.684)	50.577
11	200.351 (40.070)	5.022 (-5.122)	4.638 (4.638)	-1.399 (2.798)	-3.291 (8.228)	0.010 (-0.800)	-0.021 (0.756)	50.567
12	194.095 (38.819)	4.891 (-4.989)	3.277 (4.457)	-1.502 (3.004)	-3.671 (9.176)	0.008 (-0.647)	-0.023 (0.824)	50.643
13	218.015 (43.603)	5.655 (-5.768)	2.958 (4.023)	-0.912 (1.824)	-2.373 (5.933)	0.011 (-0.880)	-0.015 (0.540)	49.274
14	219.771 (43.954)	5.742 (-5.857)	3.128 (4.254)	-0.855 (1.710)	-2.203 (5.575)	0.012 (-0.960)	-0.017 (0.612)	49.288
15	214.288 (42.858)	5.635 (-5.748)	2.997 (4.076)	-0.957 (1.914)	-2.610 (6.525)	0.010 (-0.800)	-0.019 (0.684)	49.509

Milk: 305-d milk yield; Pro: 305-d protein yield; Fat: 305-d fat yield; DFS: days to first service; CI: calving interval; Mast: mastitis; SCS: somatic cell score; TR: Total Response; Generation interval varied between 4.191 and 4.196 among indices.

Table S2. Expected genetic and economic (in parentheses) gains for different traits in breeding goal using different restricted indices (based on 200 progenies per sire)

Index no.	Milk	Protein	Fat	DFS	CI	Mast	SCS	TR
Pro	55.702	0.000	0.502	-3.030	-7.704	-0.004	-0.022	38.255
restricted	(11.140)	(0.000)	(0.683)	(6.060)	(19.260)	(0.320)	(0.792)	
Mast	155.936	4.061	2.499	-1.949	-5.384	0.000	-0.032	48.954
restricted	(31.187)	(-4.142)	(3.399)	(3.898)	(13.460)	(0.000)	(1.152)	
DFS & CI	239.066	6.172	4.629	0.000	0.000	0.016	-0.013	47.001
restricted	(47.813)	(-6.295)	(6.295)	(0.000)	(0.000)	(-1.280)	(0.468)	
Pro &	58.644	0.000	0.563	-2.996	-7.505	0.000	-0.020	37.969
Mast	(11.729)	(0.000)	(0.766)	(5.992)	(18.763)	(0.000)	(0.720)	
restricted								

Milk: 305-d milk yield; Pro: 305-d protein yield; Fat: 305-d fat yield; DFS: days to first service; CI: calving interval; Mast: mastitis; SCS: somatic cell score; TR: Total Response; Generation interval varied between 4.186 and 4.193 among indices.