

## New fitness index: RZFit

The Total Merit Index RZG is optimized economically for average production conditions regarding its composition with 45 % milk production traits, 40 % functional traits as well as 15 % feet and legs and udder. Overall official indices like RZM respectively RZE are offered for the quick and easy selection of bulls, e.g. with breeding focus on milk production traits or conformation. With the new RZFit it is easy to make a selection from a large number of proven Holstein bulls with best traits for fitness. Thereby the German Holstein breeding can offer bulls, breeding extremely positive in this complex, resulting in appropriate improvement.

### Overview 1: Composition of the RZFit and advantage of the Top-100 according to RZFit (Holsteins)

Trait	Relative weight	Ø ZW (Breeding value) Top-100 RZFit
Daughter fertility (RZR)	20 %	115
Maternal calving traits	20 %	105
Longevity (RZN)	15 %	121
Feet and legs	15 %	115
Udder	10 %	114
Udder health (RZS)	10 %	116
Milk yield (RZM)	10 %	102
RZFit	100 %	129

### An alternative to crossbreed

The Holstein breed is the undisputed leader regarding milk production transmission but also udder quality. In contrast, its image with regard to fitness traits especially fertility is not that good. Through that the crossing with other milk breeds mainly Scandinavian Rotvieh breeds, being genetically better, is under consideration.

For practice, not the average tendency of transmission is interesting but more the transmission of the best bulls available for wide use. As a wide range can be found among almost 1,000 Holstein bulls, being tested every year just in Germany, there are also bulls for fitness at the top, standing out from the crowd. This means that they belong to the best 0.5 % with RZFit figures of more than 136. Within small breeding programs respectively breeds, in contrast, you will rarely find such outstanding sires. Clearly less than 100 Swedish Red bulls are tested annually. Also the Norwegian Red consists of maximal 120 test bulls per year. An eventually existing breed difference can be balanced by stronger selection intensity among the Holsteins.

This can be seen when looking at the Swedish Red bull Peterslund, being recommended for cross breeding the most intensive. Therefore, Peterslund has already breeding values based on German daughters. He can also offer information via Interbull on the basis of more than 32,000 daughters. His official breeding values are expressed on an Angler basis. But these can be converted into the German Holstein basis.

## Overview 2: Fitness breeding values of the Swedish Red bull Peterslund in a Holstein basis (Proofs 4/09)

Breeding values Peterslund	Angler basis	Holstein basis
Daughter fertility (RZR)	108	123
Maternal calving traits	108	108
Longevity (RZN)	114	119
Feet and legs	107	107
Udder	97	83
Udder health (RZS)	106	110
Milk yield (RZM)	119	98
RZFit		120

Overview 2 shows that Peterslund is overall really good for fitness traits and would reach an RZFit of 120. But in comparison to the highest Holstein RZFit bulls (Overview 3) it can be seen that there are many Holstein sires with an obviously higher RZFit. Another argument in the discussion about crossbreeding is the additional use of heterosis effects that should be up to 10 % for fitness traits of crossbred progeny. Even if you include these 10 % for the progeny, it would be four additional RZFit points in the bull's breeding value. Also with this "heterosis addition" and according to a RZFit of about 124, there are still almost 100 Holstein bulls just in Germany that breed progenies with better fitness traits in pure breed than Peterslund in crossbreed. Lots of sires can be found among these, offering not only an evidently better conformation but also more production than Scandinavian bulls recommended for crossbreeding. Furthermore, progenies are registered as purebred and can be marketed as breeding animals.

## Conclusion

In average, the Holstein breed is not as good for fitness traits as some other breeds. The national and international test capacity is many times higher in the Holstein breeding programs with different focus. This offers the possibility though to find even better sires for fitness traits among the Holstein bulls at the top than any other breed could have. The RZFit was developed as an applicable index to find these bulls.

### Overview 3: The highest GGI bulls arranged according to RZFit

Name	HB-No.	Dam's sire	Sire	Born	RZG	RZR	KVm	TGm	RZN	F&L	Udder	RZS	RZM	RZFIT	SiF	Owner
<b>Holsteins</b>																
Gibor	667908	Gibbon	Sunnyboy	1997	143	119	101	107	132	132	113	128	120	144	99	RUW
Sallas	328275	Stormatic	Rudolph	2003	125	119	113	105	121	129	131	119	98	139	67	WEU
Laudan	810695	Lukas	Raider	1998	134	109	101	107	137	116	122	123	111	135	99	RBB
Rahn	821429	Ramos	Prelude	2003	131	112	110	100	125	123	116	126	111	134	64	RSA
Leif	801705	Lukas	Zack	1999	130	117	104	107	131	102	119	130	109	133	98	RMV
Millennium CV	821119	Mtoto	Luke	1999	131	94	97	107	122	135	121	139	112	132	94	RSA
Zabel	802579	Zappa	Lukas	2002	125	115	110	112	124	111	113	122	107	132	70	RMV
Esquimo CV	667211	Esquimau	Blackstar	1996	108	121	108	114	126	112	115	118	85	131	98	RUW
Douglas	801759	Durham	Blackstar	2000	110	111	101	106	127	126	130	123	82	131	93	RMV
Mascol ET	840515	Mtoto	Rudolph	2000	144	110	100	98	116	121	112	125	134	130	94	LTR
Stargate	140008	Starleade	Starbuck	1999	107	128	100	112	122	123	106	109	83	129	88	VOST
Jupiter	141438	Jocko Bes	Col Duste	2001	128	96	104	112	123	131	111	122	113	129	70	VOST
Manager ET	840463	Mtoto	Rudolph	1999	118	101	104	114	121	113	123	133	99	128	98	LTR
Levin	141420	Lee	Blackstar	2000	125	118	101	104	122	122	110	112	107	128	80	VOST
Mock	669203	Mtoto	Esquimau	1999	114	124	101	98	114	118	119	115	95	126	95	RUW
Novize	325517	Novalis	Jabot	1998	132	102	103	110	122	117	115	103	121	125	98	WEU
Orlo	664096	Sexation	Tk Builde	1989	106	118	100	104	126	113	115	118	83	125	98	RUW
Junker	810821	Jocko Bes	Lasso	2000	131	116	103	108	109	114	106	111	123	125	91	RBB
Novar ET	840434	Novalis	Prelude	1998	115	115	108	110	116	116	104	111	100	125	88	LTR
Ursus	141446	Ubbo	Rudolph	2001	125	104	98	102	130	109	122	122	106	125	70	VOST
Zanardi	810941	Zunder	Rudolph	2002	121	98	107	104	121	108	124	130	105	125	68	RBB
Amadeus II	800187	Ambition	Starbuck	1993	112	113	103	112	124	115	106	106	95	124	99	RMV
Marlowe	810781	Mtoto	Mandel	2000	116	118	96	107	108	112	111	133	102	124	81	RBB
Joint	632487	Jocko Bes	Esquimau	2001	130	107	105	115	112	117	107	100	123	124	74	ZBH
Skyline	668256	Skywalker	Brios	1998	115	116	106	109	122	102	104	123	98	124	72	RUW
Rushmore	667715	Rudolph	Marvel E	1997	109	127	107	105	122	105	102	109	91	124	71	RUW
Eleve	142245	Emerson	Storm	2002	130	104	99	102	110	129	125	104	119	124	70	VOST
Strobel	802586	Stormatic	T Funkis	2003	122	110	95	95	118	123	122	115	103	124	70	RMV
Eminem	810944	Eminenz	Maloy	2002	134	103	100	107	121	119	112	105	124	124	69	RBB
Maryland	564096	Mtoto	Rudolph	2000	120	113	105	107	113	114	113	114	106	124	65	RSH
<b>Red Holsteins</b>																
Laurel	925880	Lay Out	Caveman	1999	121	119	108	103	128	125	113	110	99	132	97	WEU
Carmano	915758	Cadon	Lay Out	2001	130	107	101	100	127	123	125	120	109	131	68	RUW
Koppel	913637	Koerier	Hondo	1996	117	116	105	104	137	107	101	122	95	127	96	RUW
Bigger	912939	Bingle	Blackstar	1996	110	126	103	106	122	106	105	112	91	124	96	RUW
Asgaard	596545	Achtung	Laredo Re	2002	113	117	104	101	106	110	119	121	99	122	65	RSH
Faromir	596291	Faber	Koerier	2002	124	106	100	99	112	126	113	105	113	120	62	RSH
Goodtime	922045	Good Luck	Esquimau	2001	127	111	109	106	119	100	102	99	121	119	68	ZBH
Malvoy	916301	Marmax RF	Celsius	2002	133	102	102	100	108	124	105	98	130	118	74	RUW
Starkiss	915761	Stadel	Bingle	2001	116	110	101	99	116	118	113	96	103	118	71	RUW
Lemond	915932	Lentini R	Roels	2001	118	105	103	106	114	107	110	112	108	118	67	RUW
Cantal	915810	Cadon	Milestone	2001	116	109	114	100	116	101	99	115	107	118	66	RUW

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