

### Longevity

Why is longevity, the length of time that a cow survives or remains in the herd, so important? Generally, the cost of raising replacement heifers accounts for about twenty percent of the total costs of producing milk. Cows that remain in the herd longer need to be replaced less often. This allows fewer replacements heifers to be raised which results in a lower cost of milk production and more profit.

Unfortunately, longevity is measured so late in the life of an animal that it is difficult to directly select for the trait and make rapid, significant genetic improvement. It is more productive to select for longevity indirectly by using other traits that can be measured earlier in the life of the cow.

One method of doing this is to look at older bulls whose daughters have had the opportunity to survive to an older age and compare the relationship of other traits for that bull to his daughter longevity rating (Productive Life). The following examples used for explanation are based on data from the eighty Active A.I. Holstein bulls that had a minimum accuracy (reliability) for all traits of 90% on the August 2011 genetic evaluation release. The table below lists the four highest and lowest Productive Life bulls from this group of bulls as well as some of the other traits that they transmit to their daughters. This table is not an endorsement or criticism of these bulls, their breeders, or their marketers, but rather for the purpose of information.

Name	PL	Milk	Fat	Prot	SCS	DPR	DCD	DSB	Type	UDC	BDC	F&L
DIRIGO JEVON-ET	6.9	903	-37	27	2.78	2.5	8	5.8	0.19	0.33	-0.75	1.20
SOLID-GOLD COLBY-ET	6.0	453	23	4	2.76	2.2	4	7.1	1.87	2.07	1.86	0.79
KEYSTONE POTTER	5.0	825	8	8	2.85	1.2	6	4.7	0.72	0.74	-0.58	0.55
AGGRAVATION LAWN BOY P-RED	4.8	-103	-6	15	3.03	1.6	6	5.2	1.15	1.46	-0.14	1.14
CEDARWAL APTITUDE	-3.8	1630	45	34	3.07	-3.1	9	9.4	0.55	0.71	1.15	0.41
LADYS-MANOR WILDMAN-ET	-4.2	1441	33	39	3.14	-2.6	8	14.9	1.87	1.39	2.09	0.72
STOUDER MORTY-ET	-4.2	1206	18	25	3.11	-2.2	8	5.3	1.75	1.30	2.06	1.37
REGANCREST DOLMAN-ET	-4.3	487	10	16	2.97	-1.0	8	7.9	1.59	0.98	2.81	0.89

A statistical calculation called correlation is used to measure the relationship between longevity and the other traits. The value for a correlation between two traits can range from -1 to +1. A negative number means that as one trait increases, the other trait decreases. Of course, a positive number means that as one trait increases, the other trait also increases. The closer the number is to zero, the less relationship there is between the two traits. The trait that best predicted daughter longevity in this group of eighty bulls was daughter fertility (daughter pregnancy rate or DPR) with a correlation value of 0.67. Each point in Graph 1 represents an individual bull. The point furthest to the right is for the first bull in the table, DIRIGO JEVON-ET, who is 6.9 for Productive Life and 2.5 for Daughter Pregnancy Rate. From Graph 1, it is easy to see that daughter longevity (Productive Life) increases as daughter fertility (Daughter Pregnancy Rate) increases.

The second most useful trait for predicting daughter longevity was daughter size (Body Size Composite) with a correlation value of -0.42. Body Size Composite is a combination of the traits of stature, strength, body depth, and thurl width. Graph 2 shows that daughter longevity generally decreases as daughter size increases. The point on the graph that is the furthest to the left represents the last bull in the table, REGANCREST DOLMAN-ET, who is -4.3 for Productive Life and +2.81 for Body Size Composite.

Graph 3 shows a trait that has relatively no relationship to longevity. Udder Composite has a correlation value of -0.03 to Productive Life. The plot of points looks similar to the random pattern of BBs from a shotgun blast.

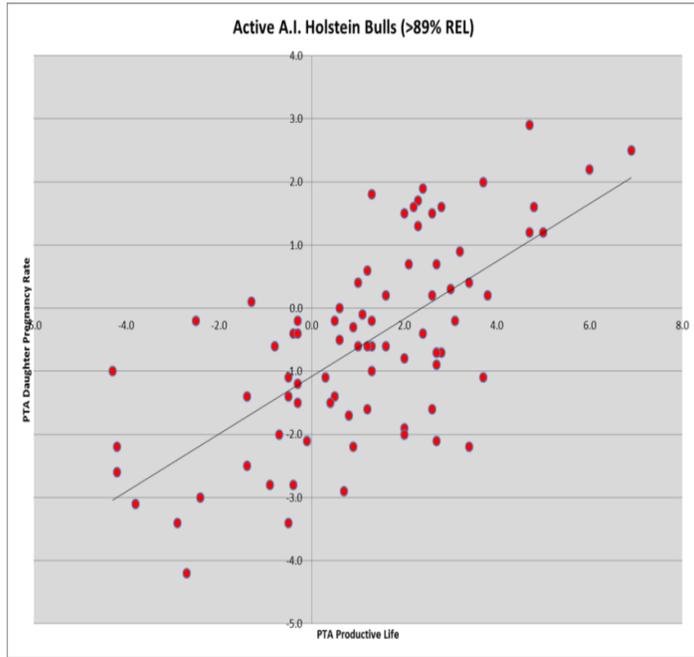
The following table lists those traits with the highest degrees of relationship to longevity among the eighty high reliability bulls, whether the relationships are positive or negative.

Trait	Relationship To Longevity	Note
Daughter Pregnancy Rate	0.67	Cows that get pregnant stay in the herd to calve again
Body Size Composite	-0.42	Smaller cows are less clumsy and less likely to get injured
Dairy Form	-0.39	Thin cows don't get pregnant easily
Daughter Calving Difficulty	-0.36	Cows that have difficulty calving don't transition well
Daughter Still Births	-0.32	Cows that give birth to dead calves have more calving difficulty
Teat Length	-0.31	Shorter teats are less likely to be injured
Somatic Cell Score	-0.28	Cows with a tendency to get mastitis leave the herd
Front Teat Placement	-0.20	Narrow teats cause the milking machine to squawk
Rear Udder Width	-0.19	Wider rear udders are meatier, don't milk out cleanly, and get mastitis
Final Score Type	-0.19	High scoring cows are big and more likely to get injured
Rear Teat Placement	-0.15	Narrow teats cause the milking machine to squawk
Udder Depth	0.15	Shallow udders are less likely to get dirty or injured

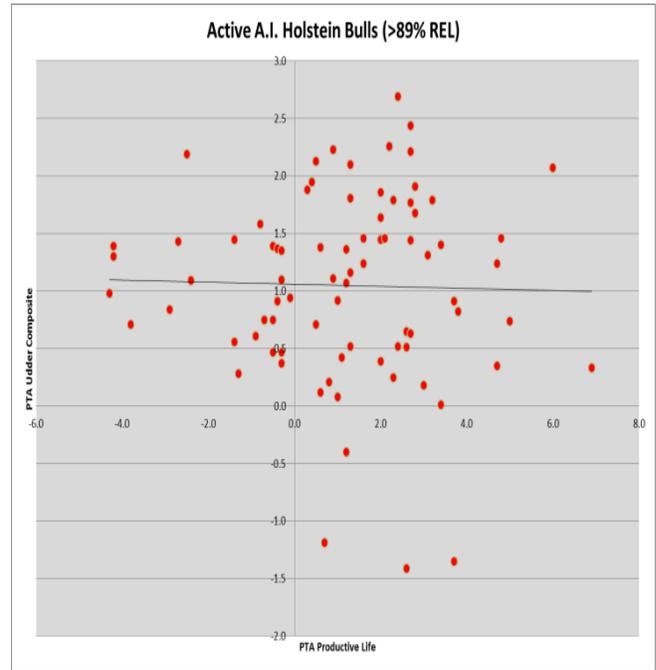
In summary, the workability traits of female fertility (Daughter Pregnancy Rate), maternal calving ability (Daughter Calving Difficulty and Daughter Stillbirths), and mastitis incidence (Somatic Cell Score) are excellent traits for predicting longevity. Of the conformation traits, size and dairy form are also excellent predictors of longevity, although in the opposite direction of what is generally believed. If you are serious about selecting for more profitable, long lived cows, I would recommend selecting bulls that transmit the following traits with selection for lower values for those traits that are in boldfaced print:

Yield	Health	Conformation
Milk yield	Daughter pregnancy rate	<b>Body size composite</b>
Fat yield	<b>Daughter calving difficulty</b>	<b>Dairy form</b>
Protein yield	<b>Daughter still births</b>	Udder depth
	<b>Somatic cell score</b>	

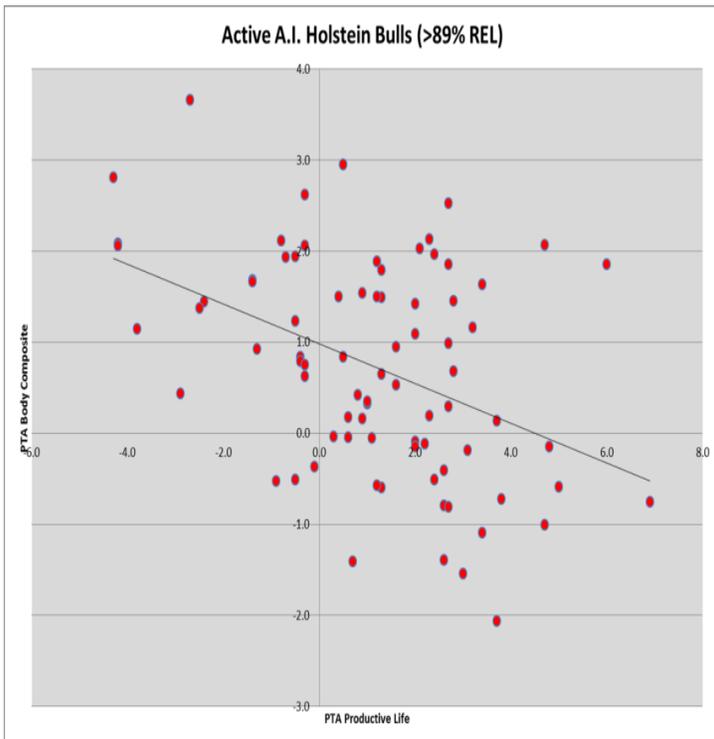
**Graph 1 - Relationship between PTA Productive Life and PTA Daughter Pregnancy Rate.**



**Graph 3 - Relationship between PTA Productive Life and PTA Udder Composite.**



**Graph 2 - Relationship between PTA Productive Life and PTA Body Size Composite**



## Worldviews Matter

A worldview is a belief system that answers the question, "What is the thing from which everything else comes?" There are two major competing worldviews today. The worldview of **materialism or naturalism** says that matter and energy and the laws of nature are the thing from which everything else comes. The worldview of **theism** says that a personal God is the thing from which everything else comes.

The worldview of materialism is responsible for the confusion about wealth that we see today. There is currently a lot of talk about the gap between the rich and the poor. Materialists believe that the amount of total wealth in the world is fixed because matter is all that there is. This belief causes people to assume that as the rich get richer the poor get poorer.

On the other hand, theists believe that God is the Creator of the universe and human beings, his representatives, create wealth by transforming the matter in the universe into resources. The free exchange of these resources among human beings creates additional wealth because after the free, unforced, exchange; each person has something of more value to them than what they had before the exchange.

Materialists are win-lose thinkers. Because they think the amount of wealth in the universe is fixed, materialists believe that the solution to poverty is to redistribute wealth. Unfortunately, what they believe does not match reality. Governments that have tried to eliminate poverty by redistributing wealth have spread poverty like a virus.

Theists on the other hand are win-win thinkers. They understand that the solution to poverty is the creation of more wealth for everyone under a rule of law that guarantees private property rights and the voluntary exchange of goods and services.

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