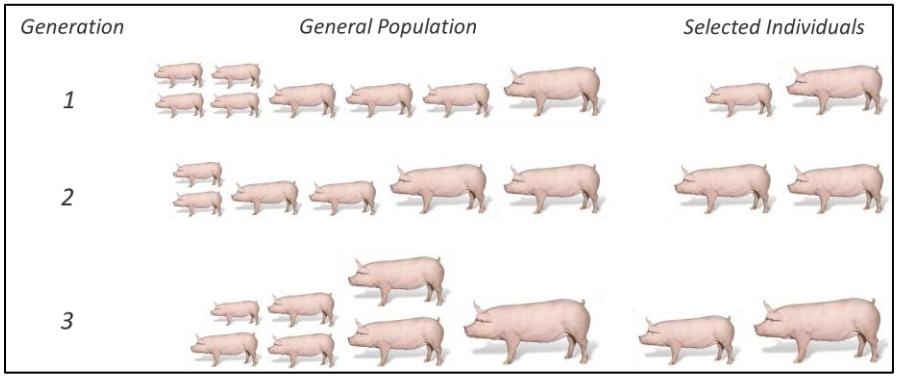
AGC Refresher

- Selection -

To have a top performing pig is good. A barn full of top performing pigs is better. A barn full of top performing pigs where each generation outperforms the previous is best. This is the essence of animal breeding: To improve animal populations over time through proper selection and mating. This AGC Refresher article will focus on selection – the process of determining which gilts get bred, which sows get culled, and which boars get used. When defined this way, it's clear that selection occurs not only in nucleus herds, but also on every commercial farm – just to a different extent.

How does one decide which pigs to include in the breeding population? Pick those with the best sets of genes (aka breeding values) to reproduce so that the next generation will have a higher proportion of these desirable genes and perform better on average. Of course this is easier said than done. We don't know what a pig's actual breeding value is, we can only estimate it.

The simplest form of selection, phenotypic selection, only uses the performance or phenotype of the individual. For example, a sow that looks good and weans a large litter will likely remain in the breeding population with the expectation that it will perform similarly in the next parity due to its assumed high breeding value. The figure below depicts another example: phenotypic selection for weight at a certain age. The largest pigs are selected to be parents of the next generation and as a result, the average weight increases over time.



Genetic progress through phenotypic selection is only successful when phenotypes are good indicators of underlying breeding values. This relationship is termed *heritability*. A trait such as conformation is highly heritable whereas fertily traits have a low heritablity. Gilts from a well structured and prolific sow will also likely be well structured, but not necessarily prolific – many other factors come into play. Nevertherless, selection for lowly heritable traits is possible by using more information, particularly, pedigree and progeny data. The phenotype of a pig's parents and piglets can provide a more accurate prediction of its true breeding value. Other relatives such as half-sibs, uncles, and nieces don't have a direct gene flow, but they do share some of the same genes and thus can contribute to breeding value estimation. Pedigree and progeny data is also necessary for sex-limited traits like predicting a boar's breeding value for number born.

Selection then becomes a lot more complicated when we're dealing with multiple traits of different heritablities and performance data from thousands of animals across different environments. Thankfully, AGC

has the Canadian Centre for Swine Improvement (CCSI) to provide genetic prediction services. Using millions of data points, complex statistical procedures, and heavy duty computers, CCSI calculates Estimated Breeding Values (EBVs) for every purebred AGC pig. EBVs are an objective measurement to help make good selection decisions.

Below is a screenshot from *www.alliancegeneticscanada.ca/view-boars/yorkshire/bvy-13113e-2729*
This AGC Yorkshire boar is one of many available to be selected as a sire in an AGC nucleus herd or in commercial herds for internal gilt replacement. Few swine genetic companies publish EBVs, use registered pedigrees, or offer visuals of selection candidates, but AGC believes in transparency. This information helps the users of AGC genetics to make good selection desicisions in order to have barns full of top performing pigs that improve from one generation to the next.

-Brent DeVries, MSc.

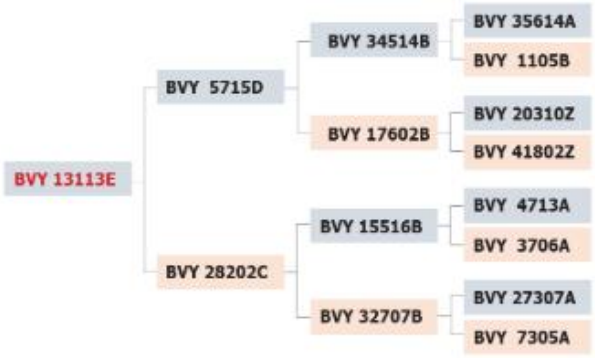
Alliance Genetics Canada

Trusted genetics.
Count on us.

BVY 13113E (2729)

RETURN TO VIEW BOARS

OSI Swine A.I. Centre (ON 2)
Tattoo: BVY 13113E
Birth Date: Mar-17-2017
CLRC Registration: 2773503



	Performance Record
Age Adjusted to 100 kg	134.6 days
Fat Adjusted to 100 kg	7.8 mm
Estimated Loin Eye Area	43.8 cm^2
Estimated Lean Yield	65.0%

	Indexes
Sire Line Index	178 pts
Dam Line Index	151 pts

	Terminal Trait EBVs
Lean Yield	-0.06%
Loin Eye Area	1.07 sq cm
Backfat	-0.17 mm
Lean Depth	2.16 mm
Age	-16.8 days
Feed Conversion	-0.187 kg/kg
IMF	

	Sow Productivity EBVs
Number Born	1.59 pigs
Piglets Born Alive	1.35 pigs
Piglets Perinatal Survival	0.66%
Piglets Weaned	0.92 pigs
Litter Weight	3.70 kg
Farrowing Interval	0.56 days
Functional Teats	0.07 teats