



Bovine Progressive Ataxia (PA) in Charolais FAQ

On September 27, 2022 the American International Charolais Association officially announced ([press release here](#)) the minor presence of Bovine Progressive Ataxia in their breed. With this being the first “defect” found in Charolais cattle, we have put together this FAQ sheet to help you remain aligned on messaging to help breeders handle this information successfully.

Q1: What is Bovine Progressive Ataxia (PA)?

A: A recessive disease in the KIF1C gene of cattle that causes incoordination. Calves are born ‘normal’, with onset of disease typically seen between 18 and 24 months of age. Cattle with two copies of the causative allele may have difficulty getting up or even become unable to rise. Females may experience pulsating urination. Progression can take several weeks up to a few months.

Q2: Is progressive ataxia a lethal defect?

A: Technically, no. While animals with two copies of the recessive allele are not stillborn as a result, affected cattle are typically either culled by 36 months of age or euthanized.

Q3: How is progressive ataxia passed down?

A: Like any other recessive condition, when two carriers of the gene are mated, there is a 25% chance that the offspring will be affected by progressive ataxia, and a 50% chance of the offspring being a carrier.

Q4: What is the frequency of the recessive allele in the Charolais population?

A: The minor allele frequency of progressive ataxia is expected to be approximately 0.08, or 8%, of cattle registered with AICA. Therefore, it is expected approximately 84% of cattle are free of PA while 15% are carriers and only 1% are affected.

Status	Equation	Frequency
Free	p^2	0.8464 (84%)
Carrier	$2pq$	0.1472 (15%)
Affected	q^2	0.0064 (<1%)

Q5: My breeding stock were previously tested on the GGP Bovine 100K, how do I get results for PA?

A: If animals have previously been tested on the GGP Bovine 100K (after September 1, 2020), please contact Maggie Smithee at AICA as the PA status of the animals may currently be available.

Results are posted to the AICA online registry system every Wednesday. If a breeder requests PA status on Tuesday, results will be made available the next day. However, for PA status requested on Thursday will have to wait until the next Wednesday.

Q6: My breeding stock were tested prior to September 1, 2020, how do I get results for PA?

A: Animals with genotypes submitted to AICA prior to the launch of the GGP Bovine 100K will need to submit a new sample to AICA and request a GGP Bovine 100K be ran with the addition of a PA test at the time of submission. Expected turn around time for results is 3 – 4 weeks.

Q7: Is progressive ataxia available as a standalone?

A: Unfortunately, due to the recent discovery of the trait, PA is only available as an add-on to the GGP Bovine 100K through NEOGEN. The cost of the GGP Bovine 100K with PA is \$32, with AICA currently subsidizing all 100K testing \$15. (Keep in mind the timeline of this subsidy is unknown)

UC Davis' lab is offering a standalone PA test for \$25/hd.

Q8: What is the most cost-efficient way to track PA status of my herd/cow lines?

A: It is most efficient to delineate carrier status of influential sires and donor dam's first. NEOGEN can obtain DNA from semen straws, tissue, blood, or hair. By testing the "top" of the pedigree first, with confirmed parentage, animals can be deemed PA Free via pedigree. This method can be used instead of testing the entire cow herd.

Once this is complete, if there are still older females that are potential carriers, those can have samples resubmitted or requested.

The frequency of carriers in a population can then be managed by only using Charolais bulls who are known to be PA Free, testing all replacement heifers, and culling all carriers.

Q9: I have my PA results, what do they mean?

A: Results for samples submitted to NEOGEN can be viewed in the AICA online registry system. AICA will note animals to be PAF (Free), PAC (Carrier), or PAA (Affected).

Please stay abreast of the situation as more information will come out of AICA's board meeting October 19-20, 2022.