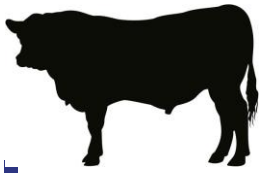
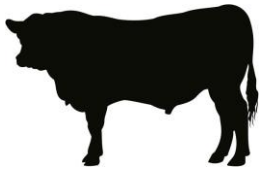


Genomic prediction of beef cattle based on genotyped dairy x beef calves a possibility?

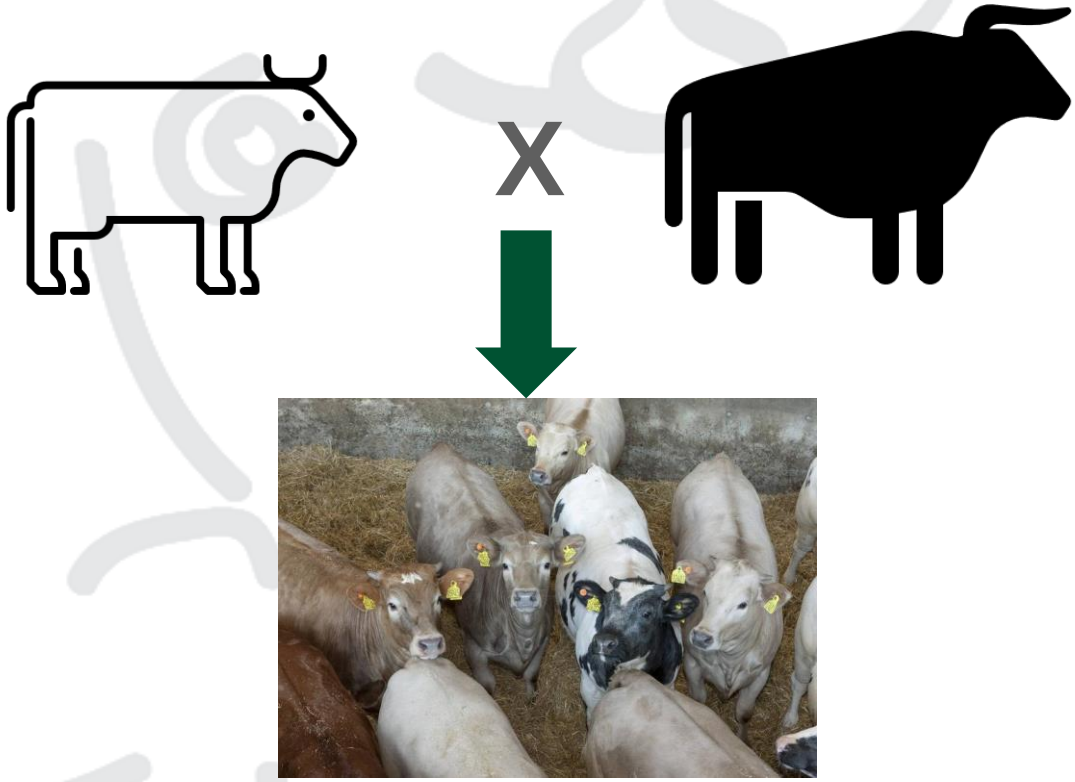
Gert Pedersen Aamand, NAV



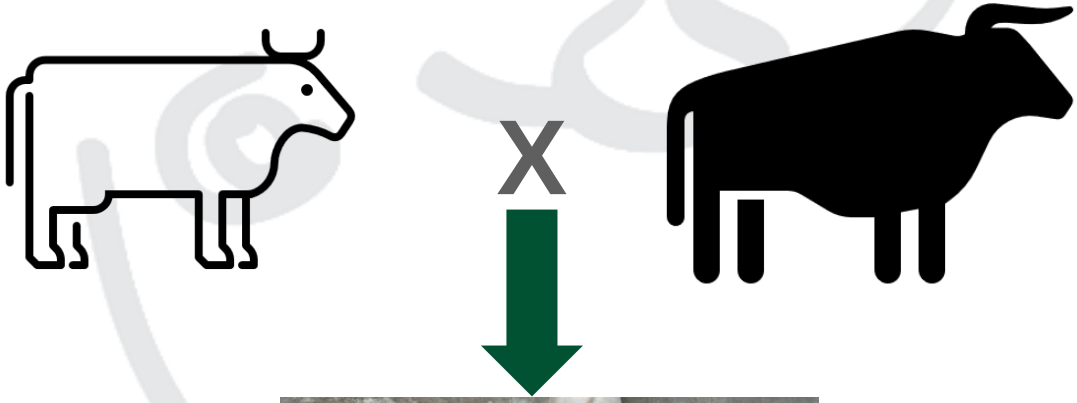
Genomic prediction of beef cattle in general

- Largest value for traits expressed late in life
  - Dam traits
  - Traits measured at the slaughtered animal
- Smaller effect for traits measured early in life
  - Note a part of the effect by genomic prediction can also be achieved by improved phenotyping of the animals itself

Genomic prediction of beef cattle based on genotyped dairyxbeef calves

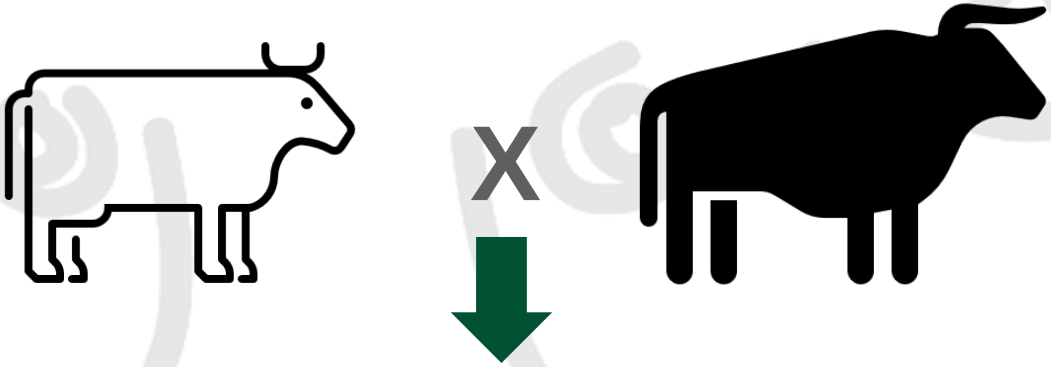


Genomic prediction of beef cattle based on genotyped dairyxbeef calves



50% Dairy
50% Beef

Genomic prediction of beef cattle based on genotyped dairyxbeef calves

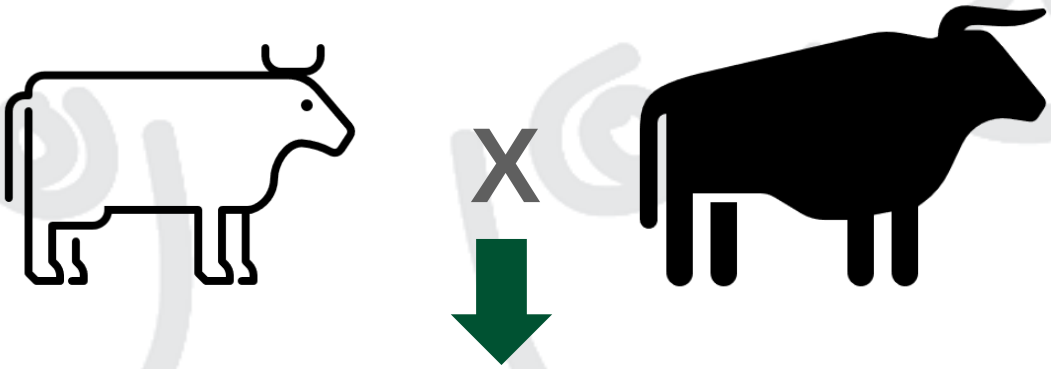


Relative few pure breed beef bulls from more beef breeds

Lots of calves with data
50% Dairy
50% Beef

NAV

Genomic prediction of beef cattle based on genotyped dairyxbeef calves

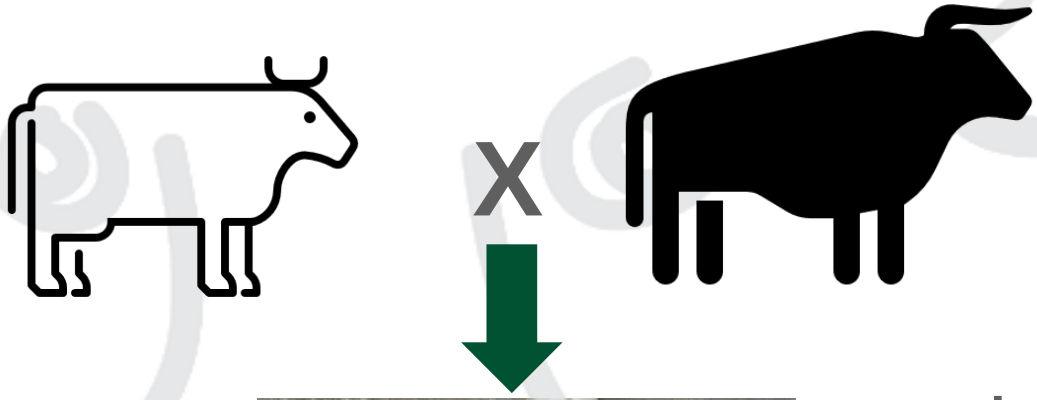


50% Dairy
50% Beef

Genetic progress :
Breeding values=
additive genetic value

BxD production:
Breeding values=
additive genetic + heterosis

Genomic prediction of beef cattle based on genotyped dairyxbeef calves

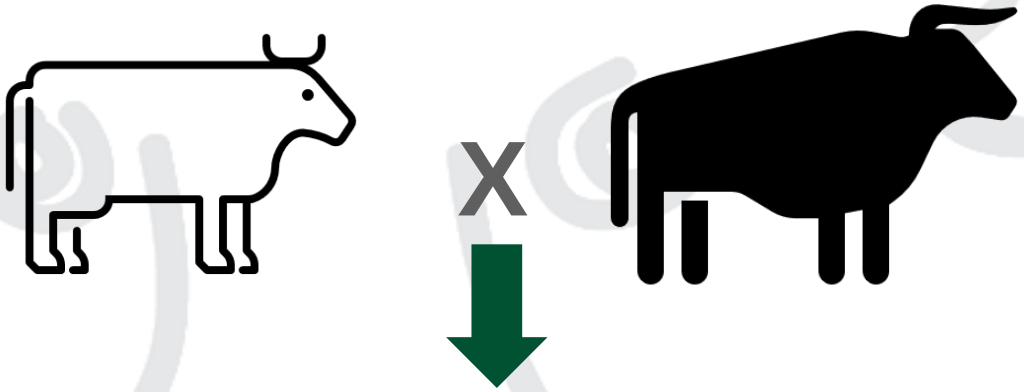


Lots of data recorded:

- **Calving**
- **Young stock survival**
- **Growth**
- **Carcass**
- **etc**

NAV

Genomic prediction of beef cattle based on genotyped dairyxbeef calves

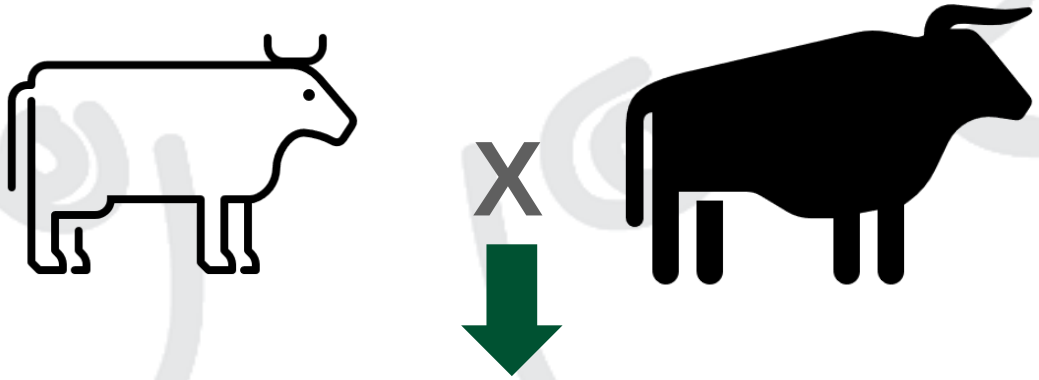


Lots of data recorded:

- Calving
- Young stock survival
- Growth
- Carcass
- etc

Phenotypes=
+ Additiv genetic value
+ heterosis
+ environment

Genomic prediction of beef cattle based on genotyped dairyxbeef calves a possibility?



Breeding value =
Additive genetic value

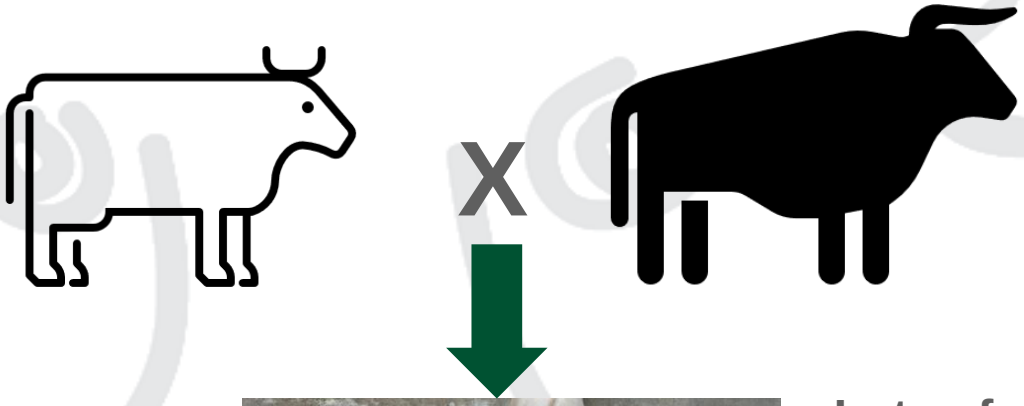
NAV BeefxDairy EBVs include heterosis

Lots of data recorded:

- Calving
- Young stock survival
- Growth
- Carcass
- etc

Phenotypes=
+ Additive genetic value
+ heterosis
+ environment

Genomic prediction of beef cattle based on genotyped dairyxbeef calves



Breeding value =
Additive genetic value

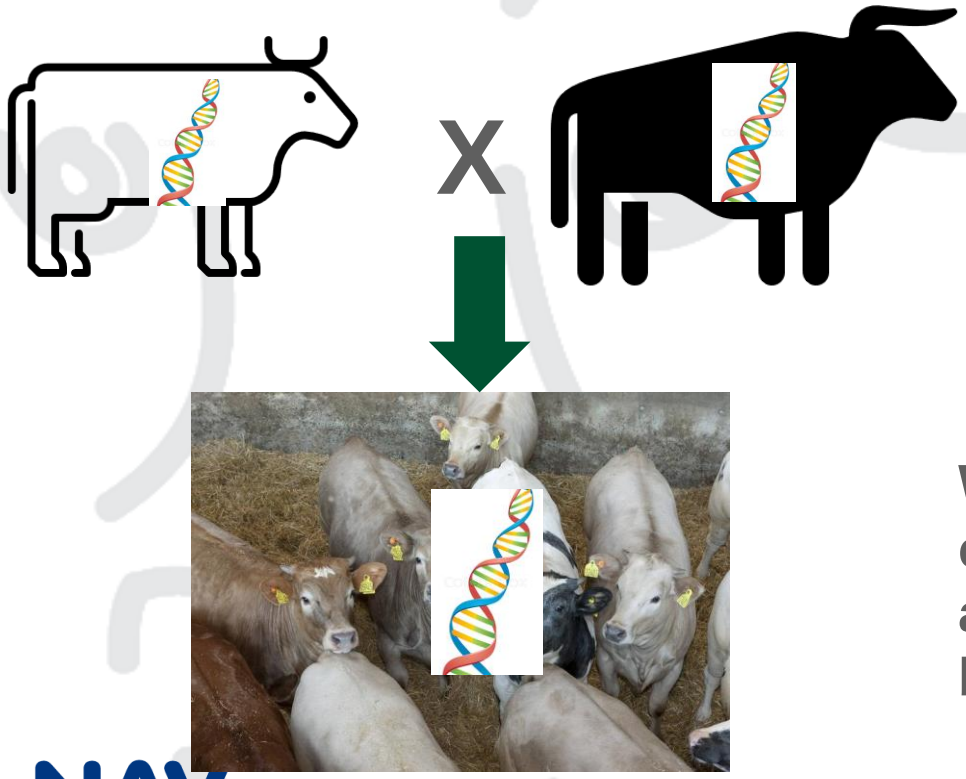
NAV BeefxDairy EBVs include heterosis

Lots of data recorded:

- Calving
- Young stock survival
- Growth
- Carcass
- etc

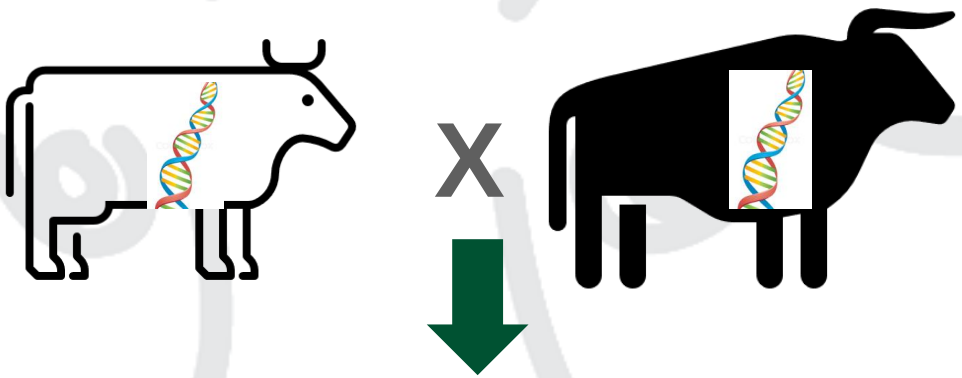
Phenotypes=
+ Additive genetic value
+ heterosis
+ environment

Genomic prediction of beef cattle based on genotyped dairyxbeef calves



We know which SNP's come from the dairy dam and which one from the beef sire

Genomic prediction of beef cattle based on genotyped dairyxbeef calves



Genomic Breeding Value
=
Additive genetic value
+
heterosis

We know which SNP's come from the dairy dam and which one from the beef sire

Genomic prediction of beef cattle based on genotyped dairyxbeef calves

	Pros	Cons
Phenotypes	Lots of data	Heterosis - all calves are 50% dairy and 50% beef
Genotype	Potential lots of genotypes	Few bulls per breed

- **Results have to show how reliable GEBVs based on BxD calves will be**
- **Validation based on BxD phenotypes and BxB phenotypes**

Pro and cons

	Pros	Cons
Phenotypes	Lots of data	Heterosis - all calves are 50% dairy and 50% beef
Genotype	Potential lots of genotypes	Few bulls per breed

- **GEBVs based on BXD data will be efficient for screening for bull giving high total genetic effect (additive + heterosis).**

BUT

- **We need results before we know if such GEBVs also can be efficient for genetic improvements of beef cattle**