Strategic Research Center

# GenSAP

Genomic Selection in Animals and Plants

# GenSAP partners

- **University partners**
  - Aalborg University
  - Aarhus University
  - China Agricultural University
  - Copenhagen University
  - French National Institute for Agricultural Research
  - Melbourne University
  - North Carolina State University
  - Norwegian University of Life Science
  - University of Wisconsin-Madison

- **Industry partners**
  - DLF Trifolium
  - Kopenhagen Fur
  - LKF Vandel
  - NAV - Nordic cattle genetic evaluation
  - Nordic Seed
  - Sejet Plant breeding
  - VikingGenetics
  - VSP - pig research centre

# Genomic selection

- Breeding for complex traits
  - Many genetic and non-genetic factors
  - Complex interactions among genes
  - Interactions between genes and environment

- Use genomewide markers in LD with causative genetic variants
  - Predict genetic merrit
  - Breeding decissions and long term consequences of those

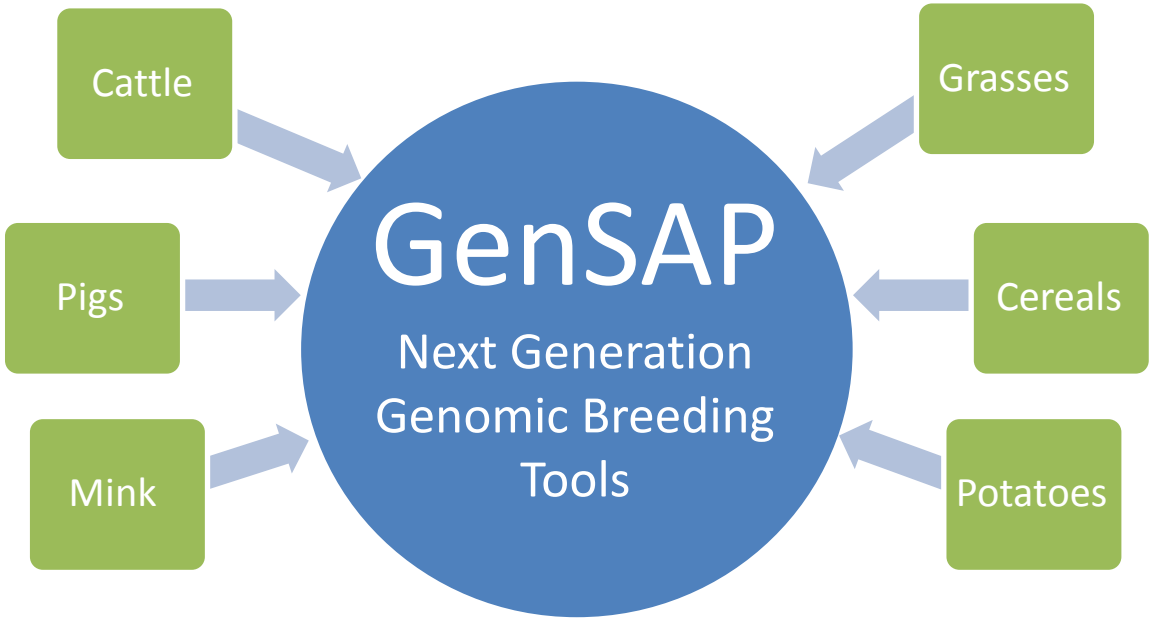
- Implemented in dairy cattle and pig breeding using 50K markers
  - Work very well for large homogeneous breeds
  - Works poorly across breeds and long genetic distances

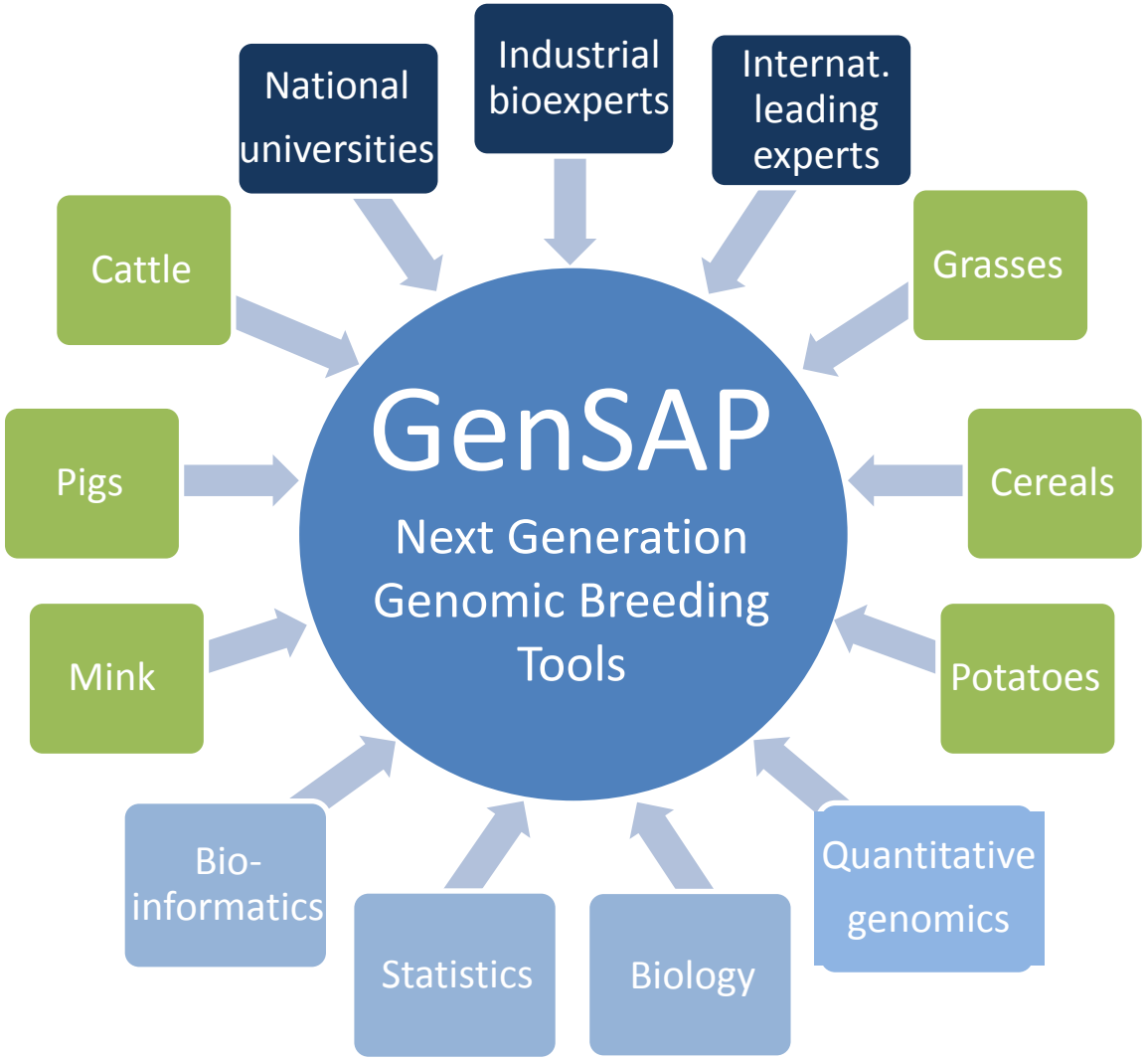
- Large potential in other species

- New technologies available (sequence, OMICS)

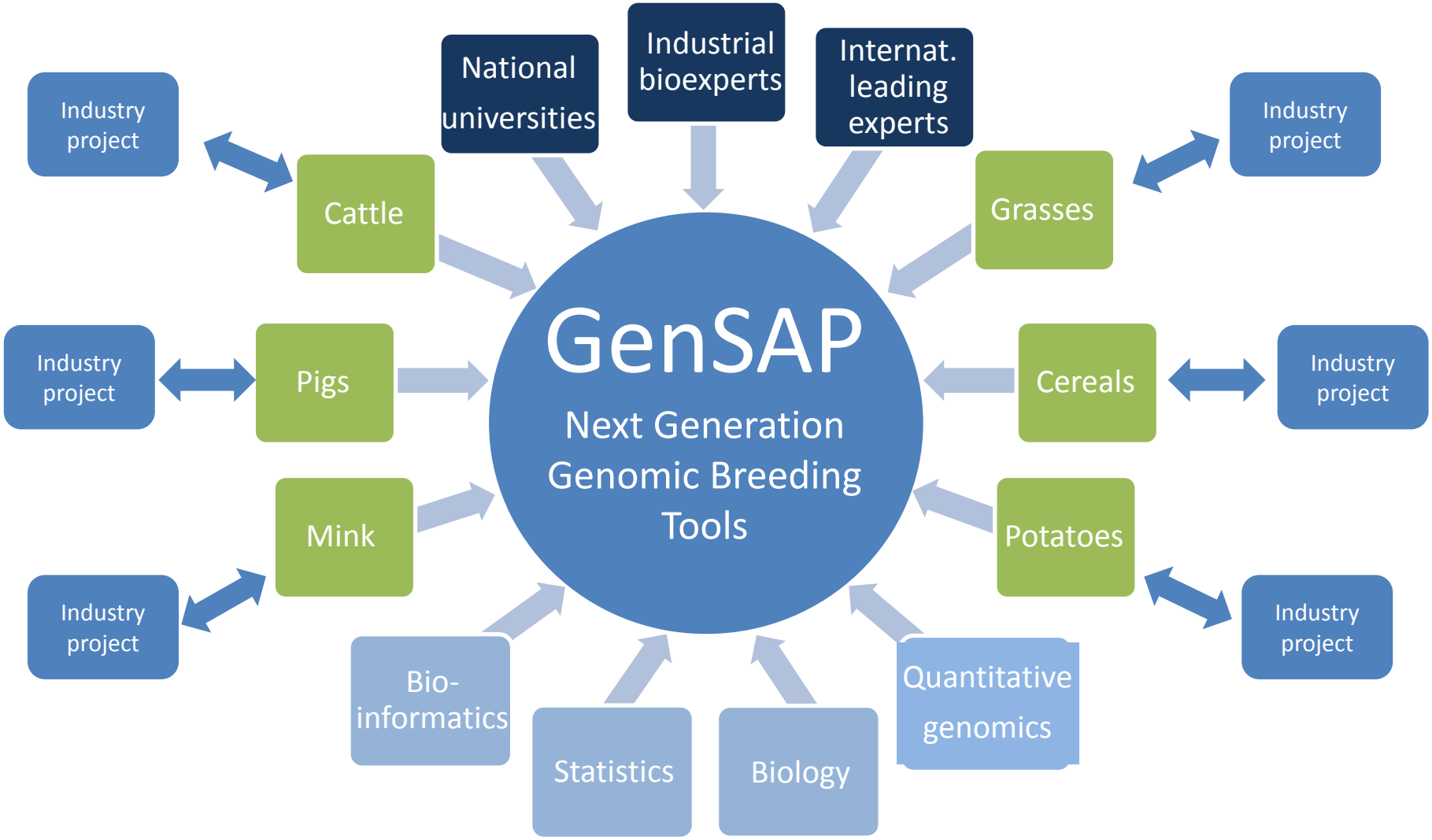
# Vision

# Animal and plant species



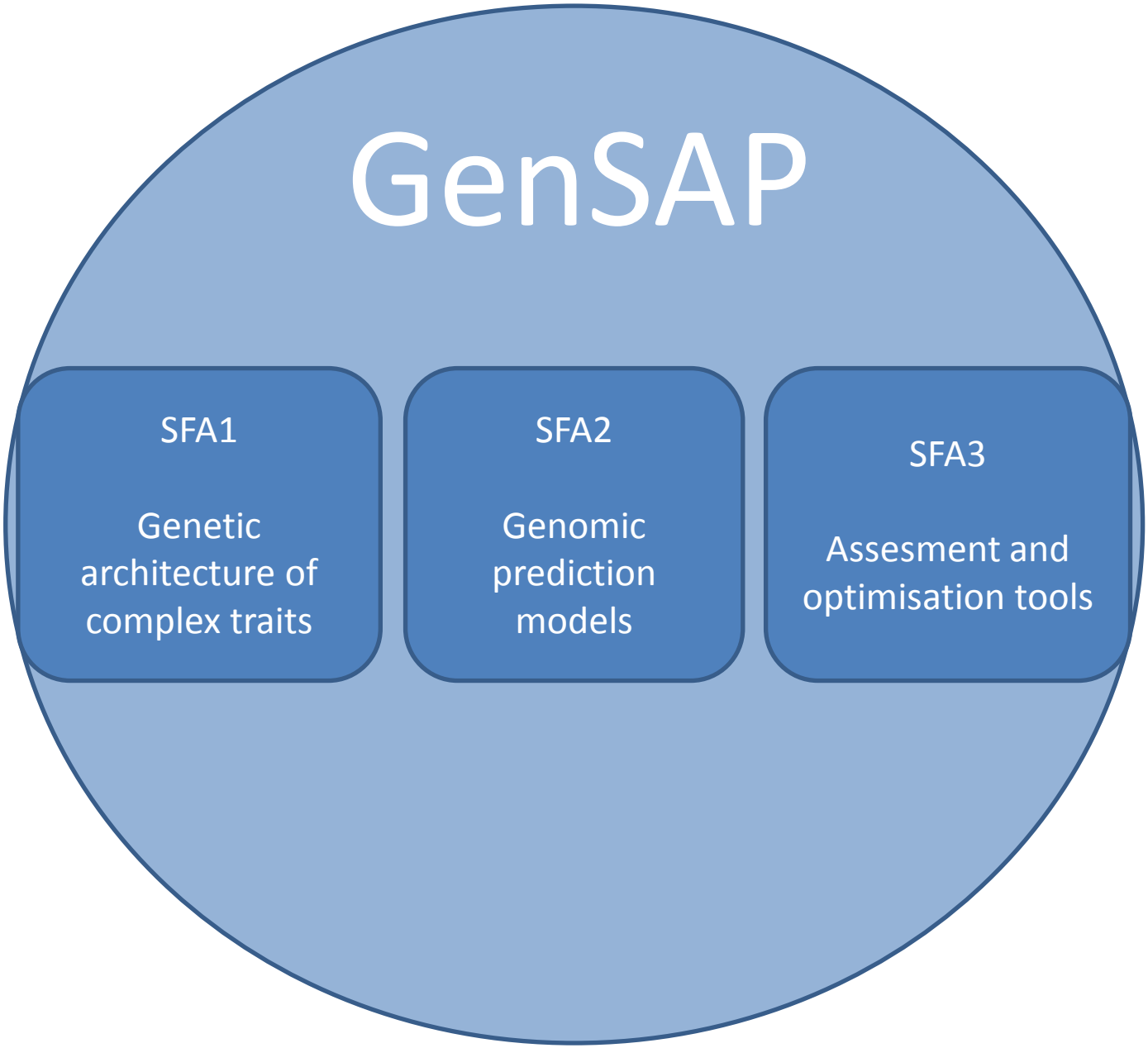

National universities
Industrial bioexperts
Internat. leading experts
Cattle
Grasses
Pigs
GenSAP
Next Generation Genomic Breeding Tools
Cereals
Mink
Potatoes
Bio-informatics
Statistics
Biology
Quantitative genomics

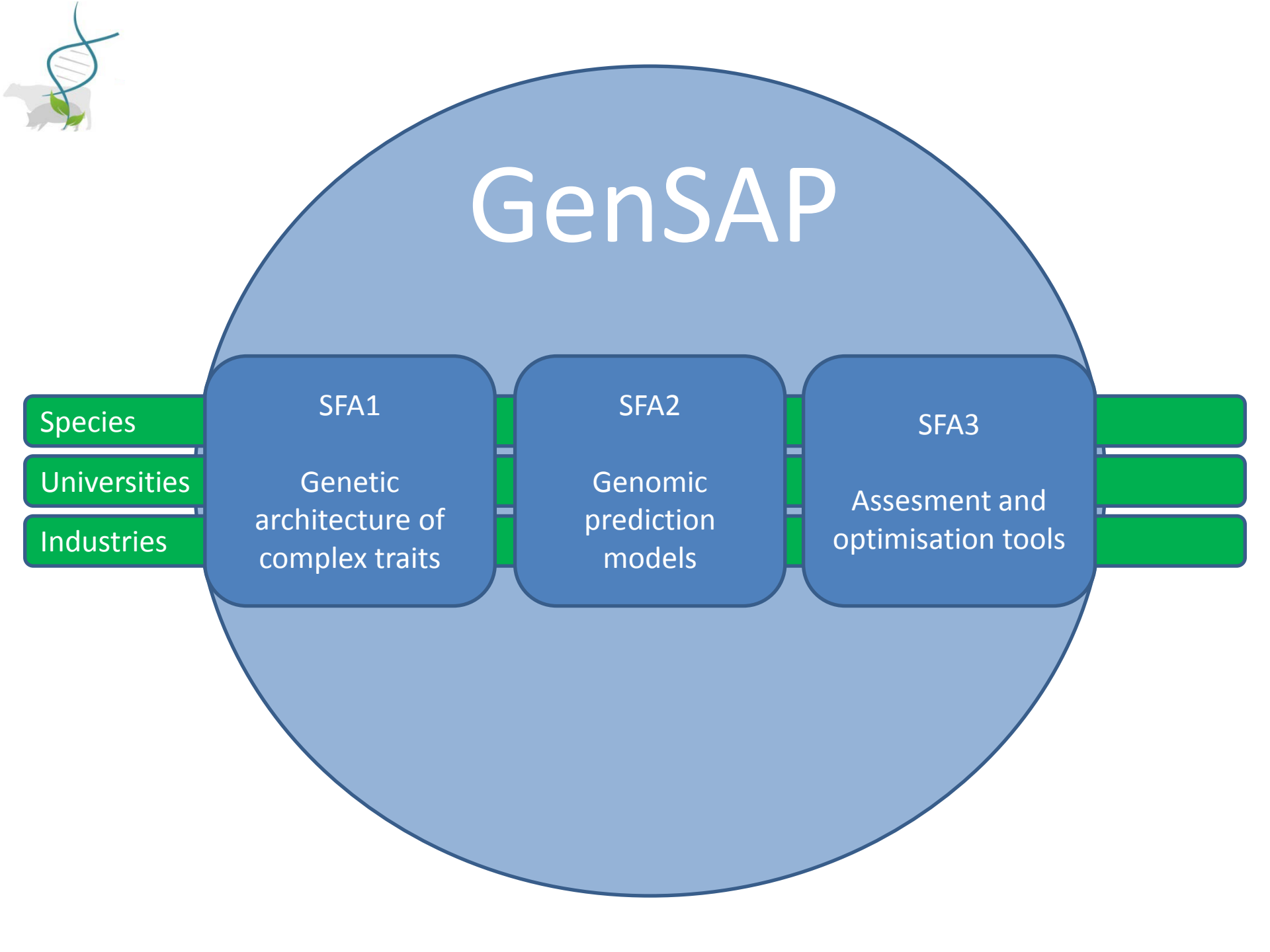
# Synergy with other projects



# Challenges

- Use full sequence information
- Genomic prediction in huge scale data
- Genomic prediction across breeds and populations
- Non-additive genetic effects
- Generalisation to plant species
- New genomic measure of inbreeding


GenSAP
SFA1
Genetic architecture of complex traits
SFA2
Genomic prediction models
SFA3
Assesment and optimisation tools


GenSAP
Species
Universities
Industries
SFA1
Genetic architecture of complex traits
SFA2
Genomic prediction models
SFA3
Assesment and optimisation tools