WAGENINGEN
UNIVERSITY & RESEARCH

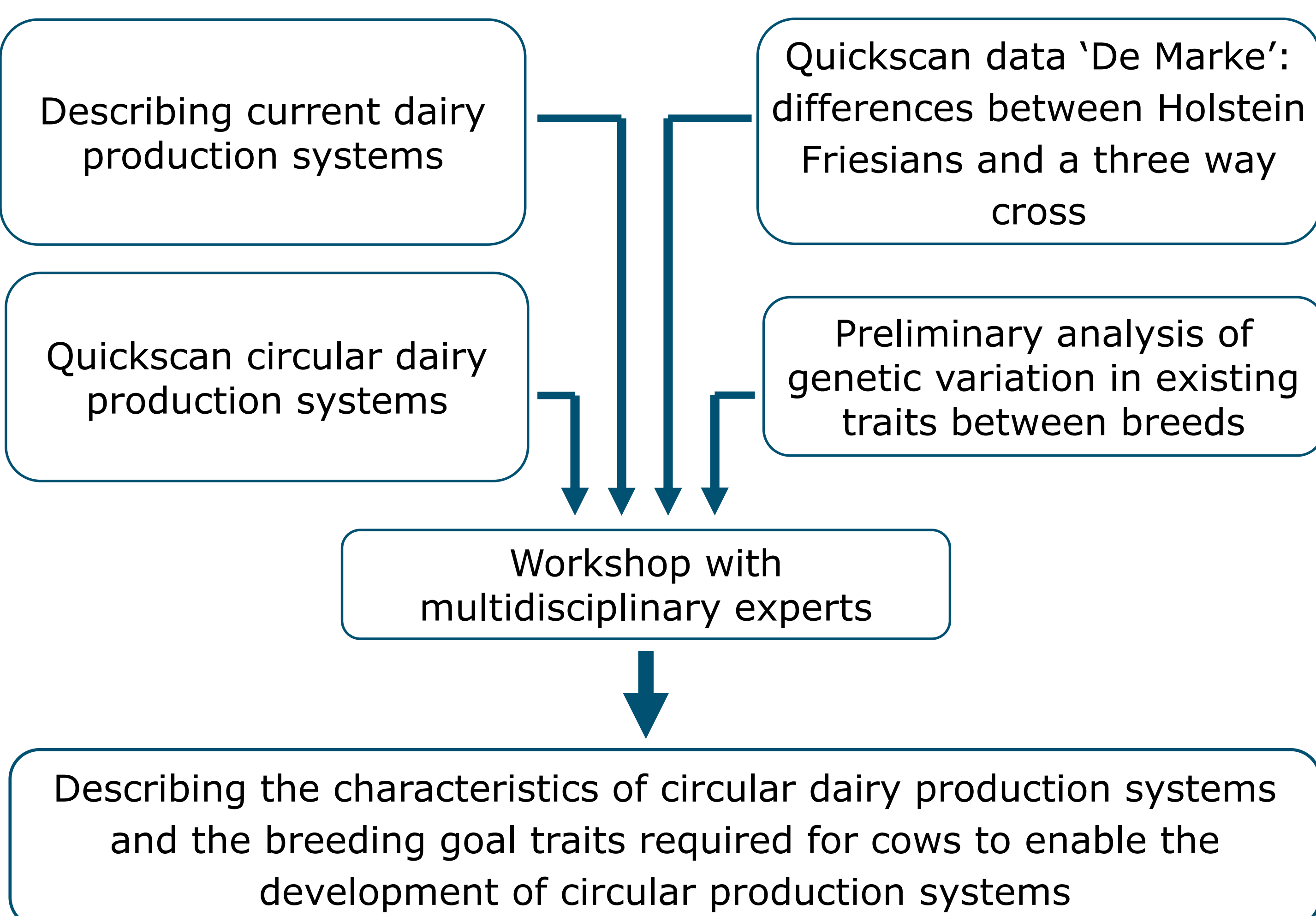# Dairy cows enabling circular production systems

Project KB-34-015-010, 2019

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Objective

Define the characteristics of circular dairy production systems and the breeding goal traits required to enable the development of circular production systems.

Project activities 2019

Describing current dairy production systems

Quickscan data 'De Marke': differences between Holstein Friesians and a three way cross

Quickscan circular dairy production systems

Preliminary analysis of genetic variation in existing traits between breeds

Workshop with multidisciplinary experts

Describing the characteristics of circular dairy production systems and the breeding goal traits required for cows to enable the development of circular production systems

Results 2019

At the 21st of October, circular dairy production systems and related traits were defined in a **workshop with experts** (Figure 1)


Figure 1. Workshop with multidisciplinary experts

❖ Nine characteristics of circular systems were defined: Flexible, Cooperative, Efficient without losses, Healthy cows, Low input without concentrates, Extensive nature and landscape, Multipurpose, Pasture based, and Closed
❖ Twenty-five traits were prioritized for circular dairy production systems of which some are novel and need to be validated (examples in Figure 2)

Grazing behaviour

Roughage efficiency
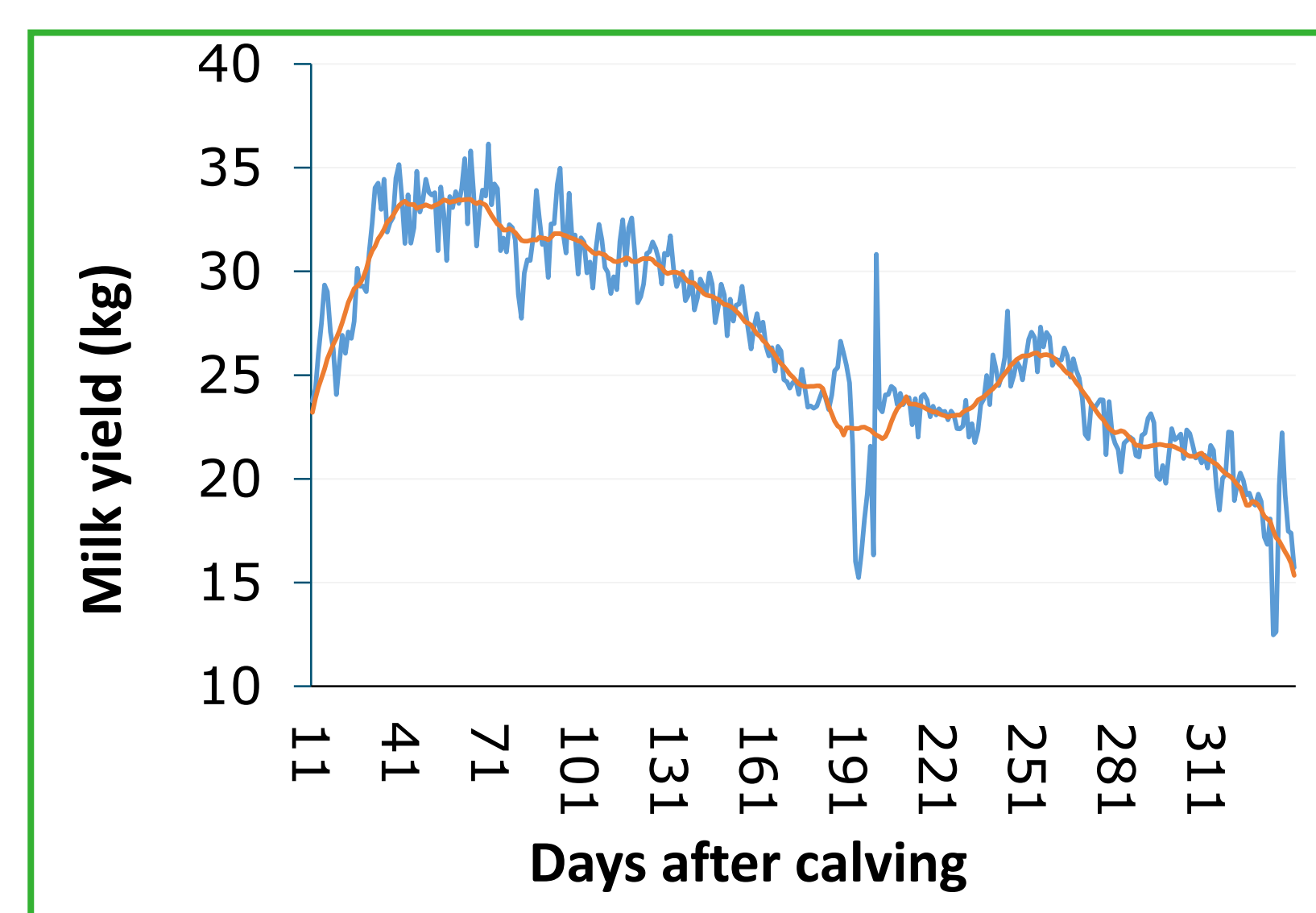
Coping with dietary fluctuations

Environmental footprint

Figure 2. Examples of novel traits for circular dairy production

Project proposal 2020

Research steps required for novel breeding programs are depicted in Figure 3. To develop breeding programs to breed for cows enabling circular production systems, the focus in 2020 will be on step 1 till 4:

1. Use models of circular dairy production **systems**, with 'De Marke' and 'Eytemaheert' as examples
2. Prioritize the required **traits** for the breeding goal
3. Set up **data collection** for novel traits
4. Determine **selection index** using existing traits as a first step
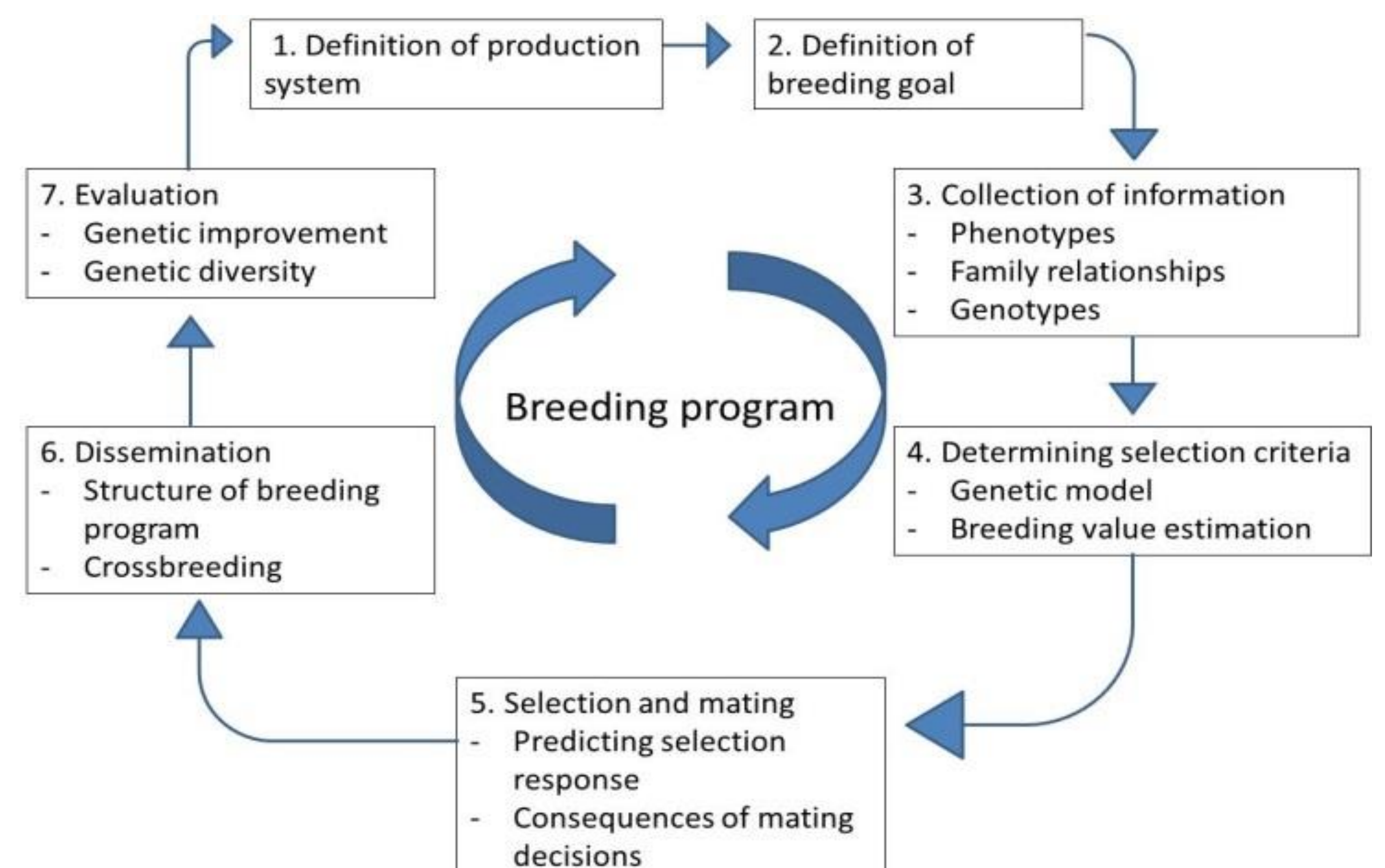5. Evaluate novel traits and add to the selection index (2021)

Figure 3. The steps te create a breeding program