Topic

Technical efficiency & animal welfare

Topic

Socio-economic resilience

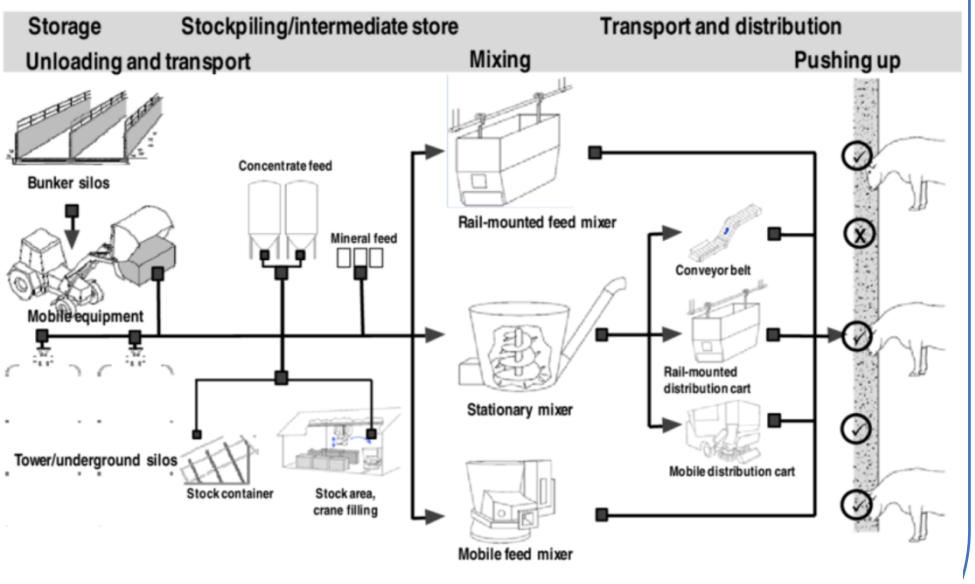
AUTOMATIC FEEDING SYSTEMS - AFS

Background

The **TMR (Total Mixed Ration)** is the most common feeding system in in-door dairy farming. Thanks to modern technology, the process of preparation and distribution of feed is partially or totally automated, with positive effects on several aspects of the farm management.

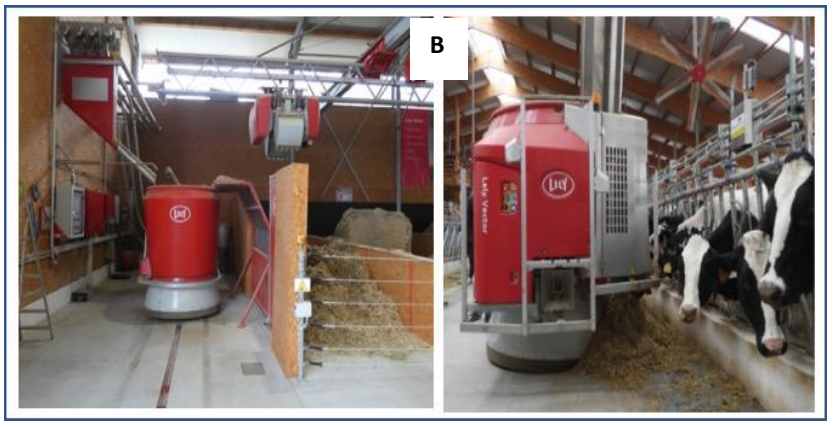
How does the strategy work?

AFS involve the automation of one or more steps of the preparation/distribution of TMR, by the use of equipment and structures that can be differently combined. The system is electric.



Credits: Techniquesfor realising various levels of automation in feeding (Haidn, 2014)

AFS with mobile feed mixer:
A – with storage container and loading by gravity
B - with floor kitchen and bucket loading/ ground storage and self-loading crane



Positive features

- Animal welfare: increase of frequency of distribution, in the trough the TMR is fresh and homogeneously mixed all along the day, reduction of errors in the preparation of the TMR, decrease of feed competition and consequent drop of stress
- Energy efficiency: the energy consumption of AFS (electric), with equal production of TMR, are reduced than the traditional system with diesel mixer wagon, with consequent reduction of CO_2 emissions, that can be nullified if the farm produces renewable electric energy (e.g. photovoltaic)
- Improvement of productivity: increase of dry matter intake with increase of production, up to 3.3 kg/d per cow (Nabokov et al. 2020)
- Adaptability to different farms and farm management
- AFS software gives valuable data to support farm decisions thanks to the feed intake monitoring and to the left over in the feeder
- Farmer social conditions: reduction of need of workforce and increase of need of managerial and supervision work

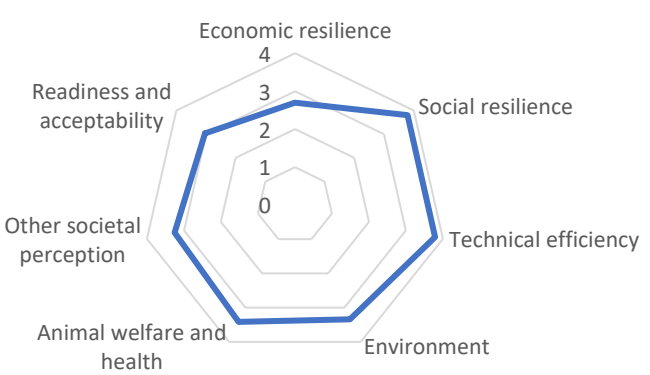
Be careful, especially on these points

- In consideration of the considerable initial investment, the choice about the possibility of installing an AFS must be led by the potential benefits!
- Some technological skills are needed, however the most common graphic interfaces are user friendly
- A maintenance program must be defined: most often it is set and offered by the AFS developer

Specific advises

To combine a NIR sensor to the AFS brings to the reduction of human mistakes in the TMR composition and ration (quantity) definition, with increase of dry matter intake and consequent optimization of productivity!

Assessment of method



Quote of a farmer:

"With AFS animal and workers welfare has improved… and also productivity has increased!"

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