



A Quality Cost Delivered approach in dairy cattle farm

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Study on dairy farm management

- Technical and economic efficiency → Monitor and improve partial indicators (Atzori et al., 2021; Ondarza e Tricarco, 2017)
- Lean Management → Improve farm organization and work efficiency, cut waste (Melin, 2020; Hocken et al., 2019)

Focus in different parts of farm structure, no systemic vision

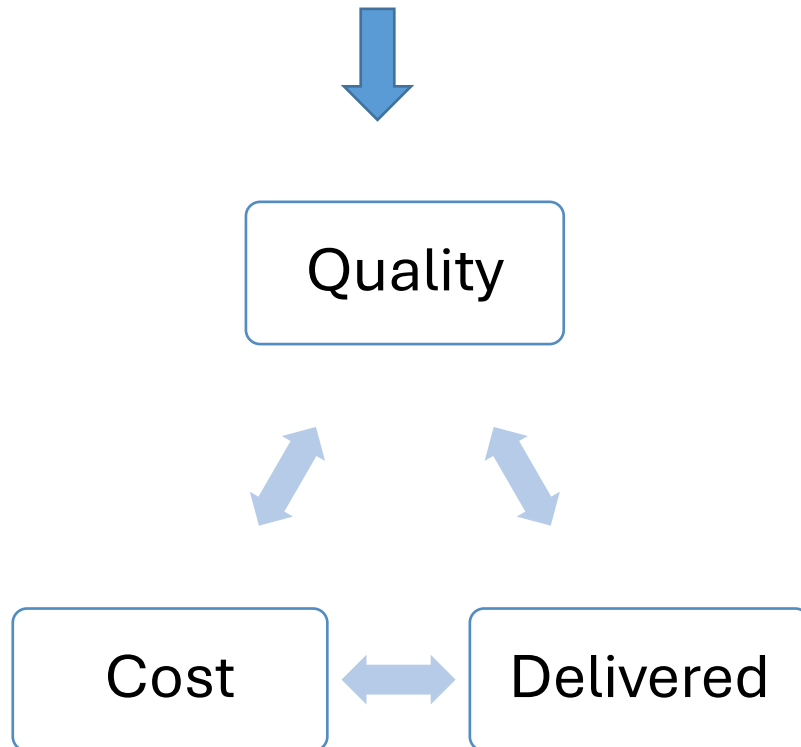


Introduction: Quality cost delivered approach

Is an approach for a process analysis

Quality Cost Delivered (Sciuccati et al. 1997)

→ Origin in the automotive sector (DTI, 2022)



Objective

Integrate **Quality Cost and Delivered** approach in a dairy cattle farm for the feed area, in order to support decision-making process



Materials and methods: Quality, feed area division

Feed area

Location: Sardinia
N° of milking cattle: 227
Year: 2023
Indicators on yearly basis



Nutrition team



Dairy Herd

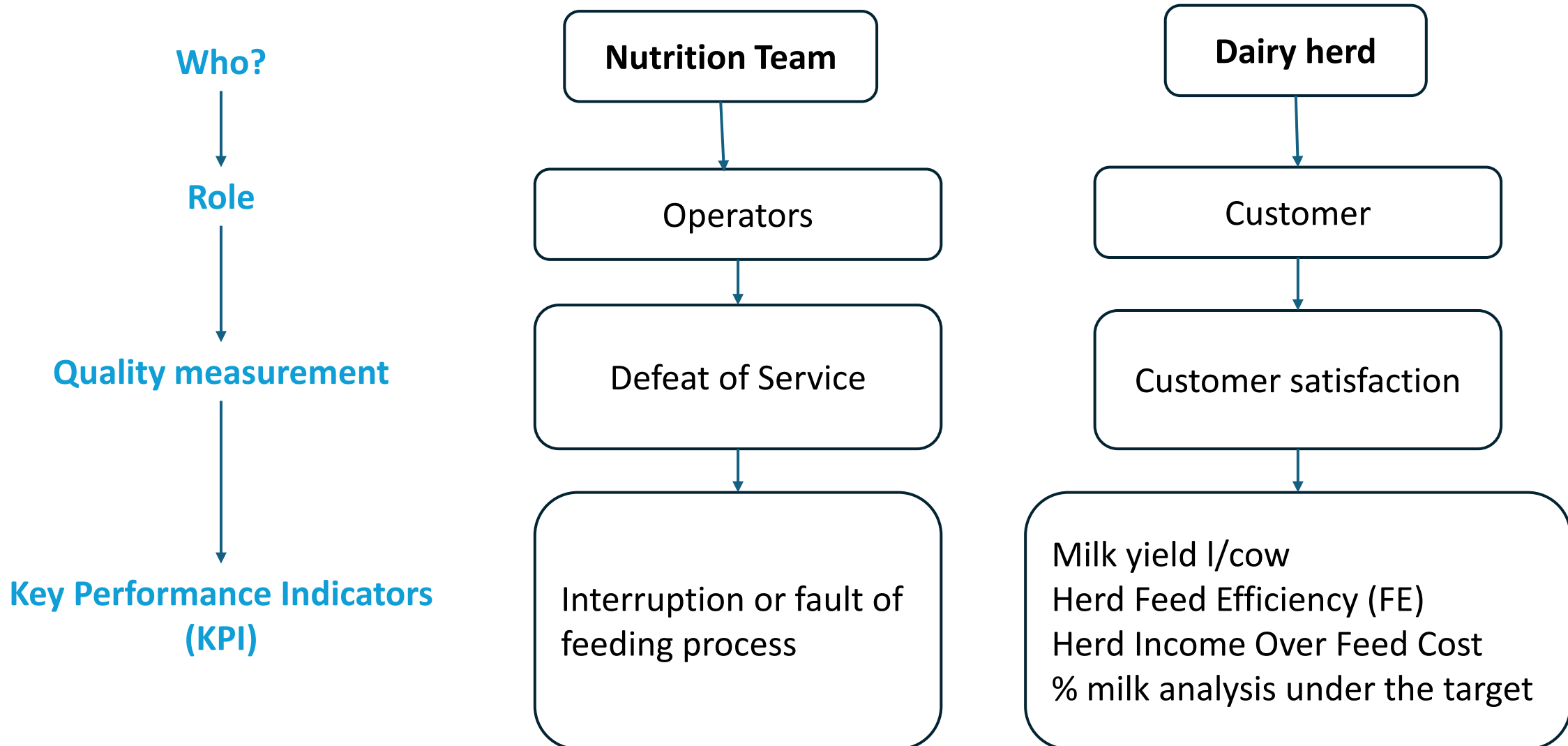


Operators



Costumers

Materials and methods: quality measurement

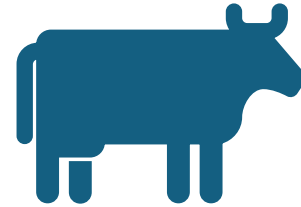


Materials and methods: quality measurement KPI



Nutrition team (operators)

- Interruption or fault of feeding process



Dairy herd (customer)

- Milk yield: Milk delivered (l)/ n°of milking cow
- Herd FE: Milk delivered (l)/ total Herd DMI (kg)
- Herd IOFC: revenues from milk (€) – feed cost (€)
- % of times under milk quality greed payment

Material and methods: cost evaluation

- ☐ Feed
- ☐ Work
- ☐ Fuel
- ☐ Maintenance

Were calculated in total and expressed in €/milking cow

Matherials and Methods: delivered

Method of evaluation



Work Sampling (Kirwan and Ainsworth, 1992)



Mapping activities and relative time

Step:

- Activity mapping
- Time measurement
- Data analysis



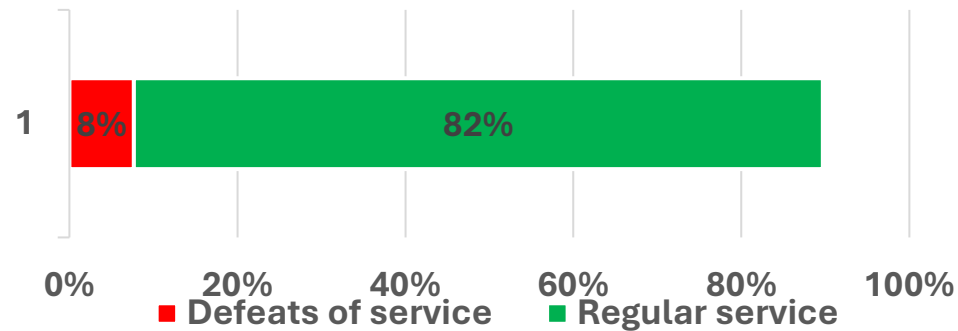
Time mapping **Lean** (Womack and Jones; 1998)

Value added	Non Value Added	Waste
• unifeed delivering	• Move without feed	• Non work conversation
IMPROVE	REDUCE	ELIMINATE

Results: Quality



Operators (Team Nutrition)



1 on 13 days



Customer (Herd)

Milk yield = 33.3 l/cow

Herd FE = 1.02,

IOFC = 444,187 €/yr

16% of milk quality analysis were not conformed to HQ over the year

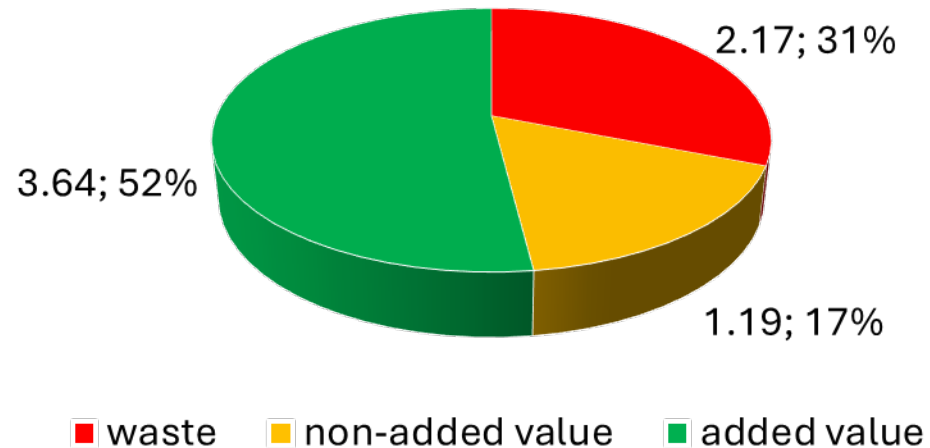
Results: feed area cost

	€/year	€/cow	% on total
Purchased feed	897,291 €	4,135 €	79%
Self produced feed	189,371 €	873 €	17%
Labor	23,962 €	110 €	2%
Fuel	21,432 €	99 €	2%
Maintenance	3,254 €	15 €	0.3%
Total 2023	1,135,310 €	5,232 €	100%

Results: time

- 1 operator was needed
- Working daily for 7 hours
- Time: 21 min/d and 121 hours/yr per cow in milk

Work sampling repartition hours/day



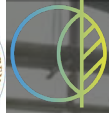
Results: time and cost corrected

Cost €/hour 10.89

	Waste	Non Added-Value	Value Added
Hours/year	678	372	1511
€/year	7,428 €	4,074 €	16,534 €

Conclusion

- Analyze feed area with QCD allows to individue easily farm inefficiencies
- Work time efficiency in feed area can increase at least of 31%
- This could be integrated in strategic planning for farm evolution
- It could be extended at different areas and compared with different farming system
- A relation with other technical aspect is needed to future implementation



Thank you! Question?

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