

Best observed practices in efficient farms: How Data Envelopment Analysis (DEA) can serve as an innovation identification tool

Alexandros THEODORIDIS¹, Anna TAFIDOU², Georgia KOUTOUZIDOU³, Emmanuel MORIN⁴ and Georgios ARSENOS¹



¹School of Veterinary Medicine, Aristotle University of Thessaloniki, Greece

²School of Mathematics, Aristotle University of Thessaloniki, Greece

³Department of Applied Informatics, University of Macedonia, Greece

⁴L'Institut de l'Elevage, France



Objective

- Reveal the **best observed management and production practices** that can be potentially adopted as **innovations by sheep farms** of the same or similar production systems
- Connect the concept of **efficiency** with the **best observed practices** and to the identification of innovations

Methodological Approach

- **Technical Efficiency (TE)** analysis through the application of **DEA** and identification of the **efficient farms**
- Identification of the **practices that the efficient farms** implement at full potential through
- Recording of these best observed practices on a **template** of **potential innovations** (expert judgement)

DEA model

- Data from **60 extensive dairy sheep farms** that rear **Manech or Basco-béarnaise & Lacaune** breeds in the **Western Pyrenees & Roquefort** areas (FR) were used
- Efficiency score for these 60 farms was **85.7%**
- **22/60** farms allocated in the full efficiency group



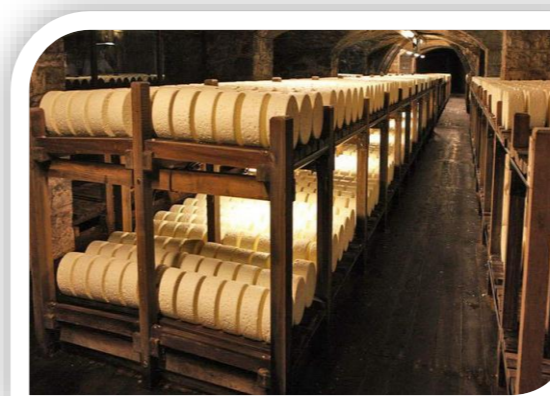
BEST OBSERVED PRACTICES

General Categories of Farm Practices	No of efficient farms that have selected at least one farm practice	No of practices selected by the efficient farms
Breeding	14	48
Reproduction	13	15
Feeding	12	27
Gadgets and Apps	12	17
Product marketing	10	12
Health	6	7
Info & training	5	8

EFFICIENT vs INEFFICIENT FARMS

Technical and Economic data	Efficiency farm groups	
	Inefficient (TE = 0.774)	Efficient (TE = 1.000)
Number of farms	38 (63.33%)	22 (36.67%)
Number of ewes	428	387
Yield (lt/ewe)	209	244
Total labour (ewes/ALU)	221	265
Feed supplied (Kg DM/ewe)	602	620
Labour cost (€/ewe)	116	99
Feed cost (€/ewe)	69	73
- Home-grown feed (€/ewe)	21	19
- Purchased feed (€/ewe)	48	54
Other variable costs (€/ewe)	32	32
Fixed Capital cost (€/ewe)	188	177
Production cost (€/ewe)	405	381
Gross revenue (€/ewe)	296	342
Gross margin (€/ewe)	195	237

DEA as innovation identification tool



Farm Practices	No of efficient farms
Matching animal requirements and supply	8
Increased Forage/Pasture Quality	13
Assisted reproduction techniques	13
DNA data collection and use in programs	11
Use of elite flocks	11
Tools to monitor BCS and pasture state	3
Computer farm management programs	2
Electric identification systems	12
Data linked to animal ID for Decision Making	3
Certification/Branding of products	12

