3rd Mountain Livestock Farming Systems Meeting: Adaption of mountain livestock farming to global change
Clermont-Ferrand, France, 5-7 June 2024

Cost-benefit analysis of digital and precision livestock farming technologies for sheep and goat farms

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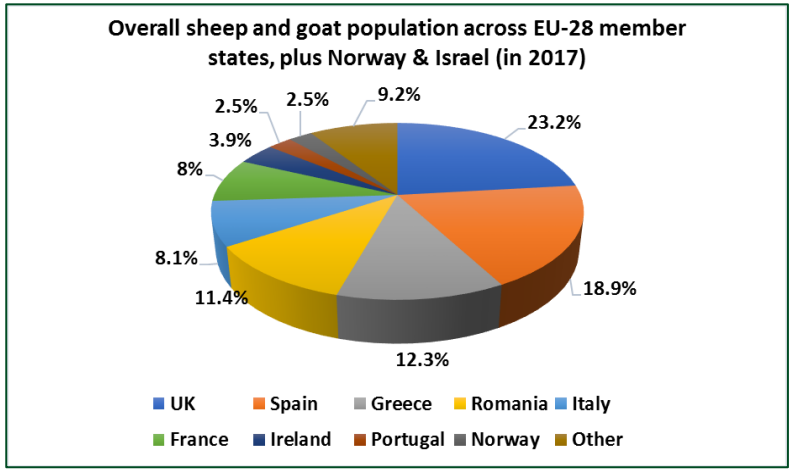
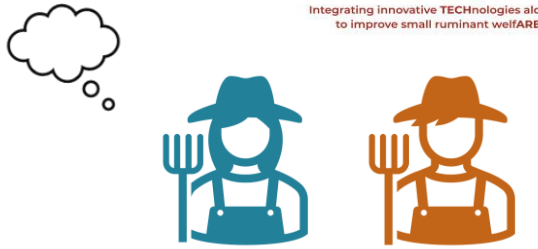
Context

- Sheep & Goats in Europe
- Challenging environments
- Varied production systems
- Important societal, environmental and cultural roles, especially in mountain areas
- Labour issues
- Technology can improve production efficiency
- Technology & innovation uptake is slow
- Misconceptions about technologies

How to encourage uptake??



How to encourage uptake?



1. Understand what farmers need
2. Propose technologies & innovative solutions that could help answer those needs

3. Provide **information**

Small Ruminant Technologies

PLF and Digital technologies for small ruminants

Technology needs & solutions

- National & international workshops
- Identify & prioritise

166 farmers' needs

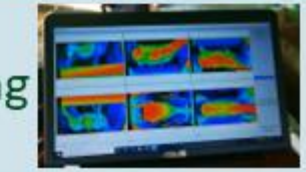
60 solutions proposed

- National workshops
- Propose solutions to needs

- Transnational workshop
- Preferred solutions

30 innovative solutions

30 prioritised solutions

Aptimiz app 	Auto-drafter 	Automatic feeder 	Automatic grass plate meters 	Connected fences 
Dairy Parlour EID reader 	DNA parentage 	Drone 	EID-enabled water trough 	EID-enabled weigh crate 
EID stick readers 	Farm management software 	FEC Pak 2 	Feed ration planner 	Flock recording app 
GPS Collars 	Milk feeder for kids/lambs 	Milk flowmeter 	Milk tank weigh scale 	Portable NIRS 
Post dried hay technology 	Pregnancy scanning 	Shed cameras 	Sheep conveyor 	Somatic Cell Counter 
Virtual fence 	Walk Over Weigh 	Water meter 	Weather station/ fan cooler 	3D imaging 

Cost-benefits analysis

- Costs:
  - Initial set up
  - Running costs
  - Training requirements
- Benefits:
  - Management
  - Animal
  - Technical
  - Other
- Overall summary:
  - Ease of use (1 – 10)
  - Value for money (Y/N/Maybe)
  - Recommendation (Y/N/Maybe)

Horizon 2020 Programme

Another benefit not listed? Please give details:

Helps to assess ewe, ram & lamb performance.

Ability to collect data for genetic improvement programmes.

Allows the use of multi-sire mating groups (rather than single sire groups / artificial insemination)

Less labour required at lambing time for recording.

Overall summary:

- **Ease of use?** *Scale 1 (Complicated) – 10 (Simple)*

  1 2 3 4 5 6 7 8 **(9)** 10

- **Value for money (*for this type of benchmark farm*)?** Yes ~~/ No / Maybe~~
- **Recommend this tool/technology for use on other types of farm?**

  Yes ~~/ No / Maybe~~

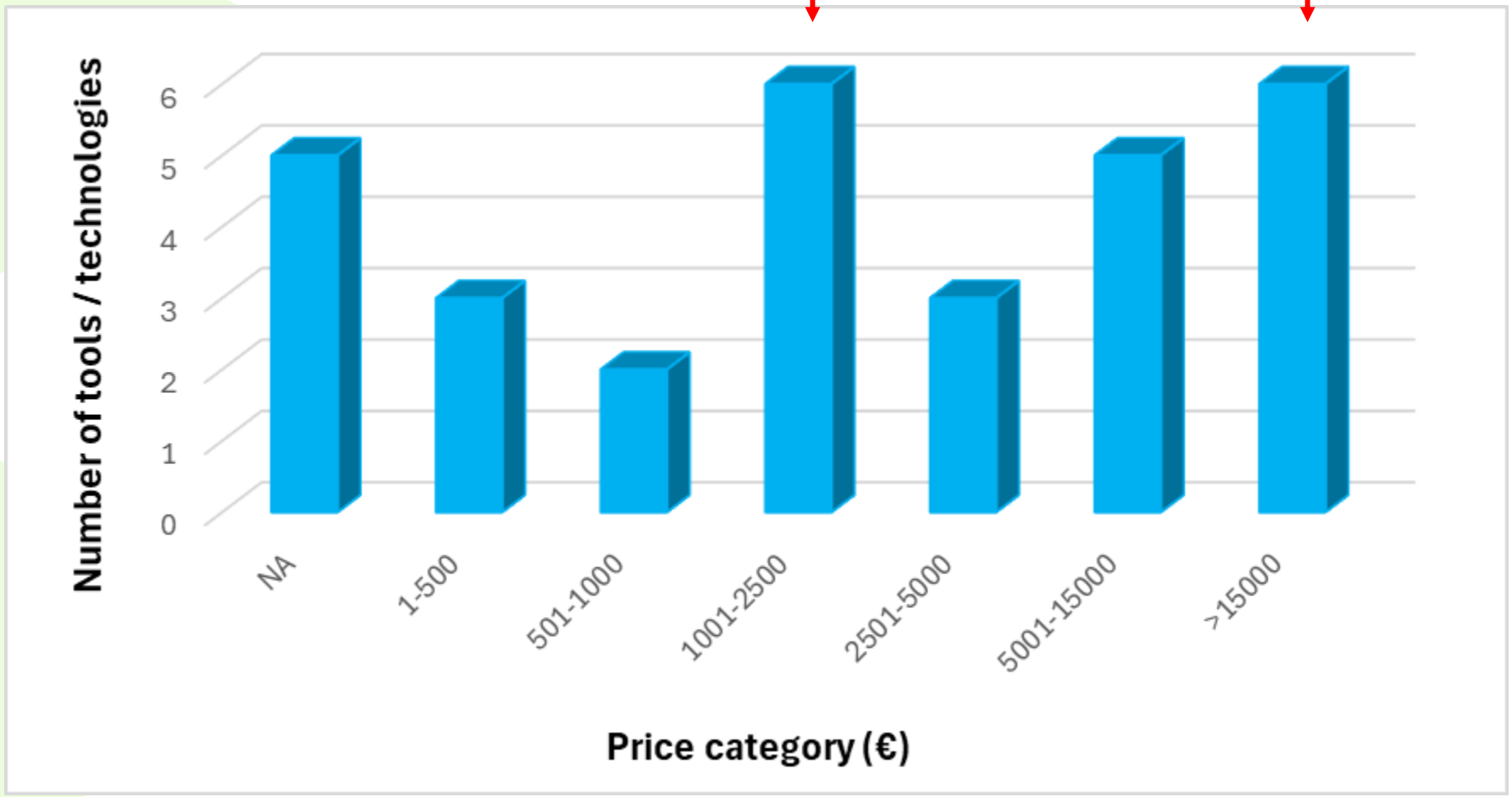
- **Additional comments?**

  Large initial cost of sampling every animal in the flock, but yearly costs thereafter only include lambs born each year and any new animals joining the flock.

  Only useful if the data (pedigree information) is going to be used.

Costs

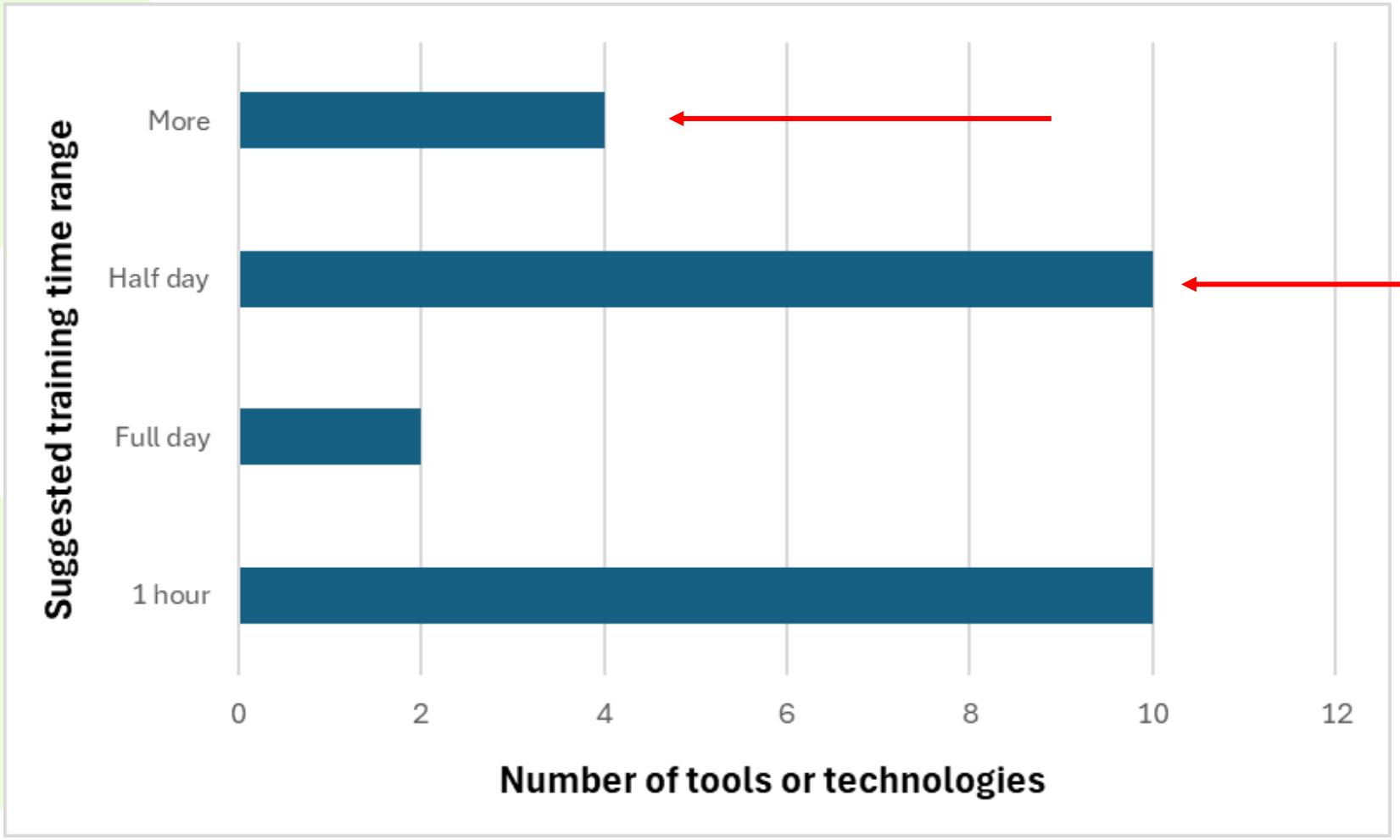
- Capital costs



25 out of 30 technologies

Costs

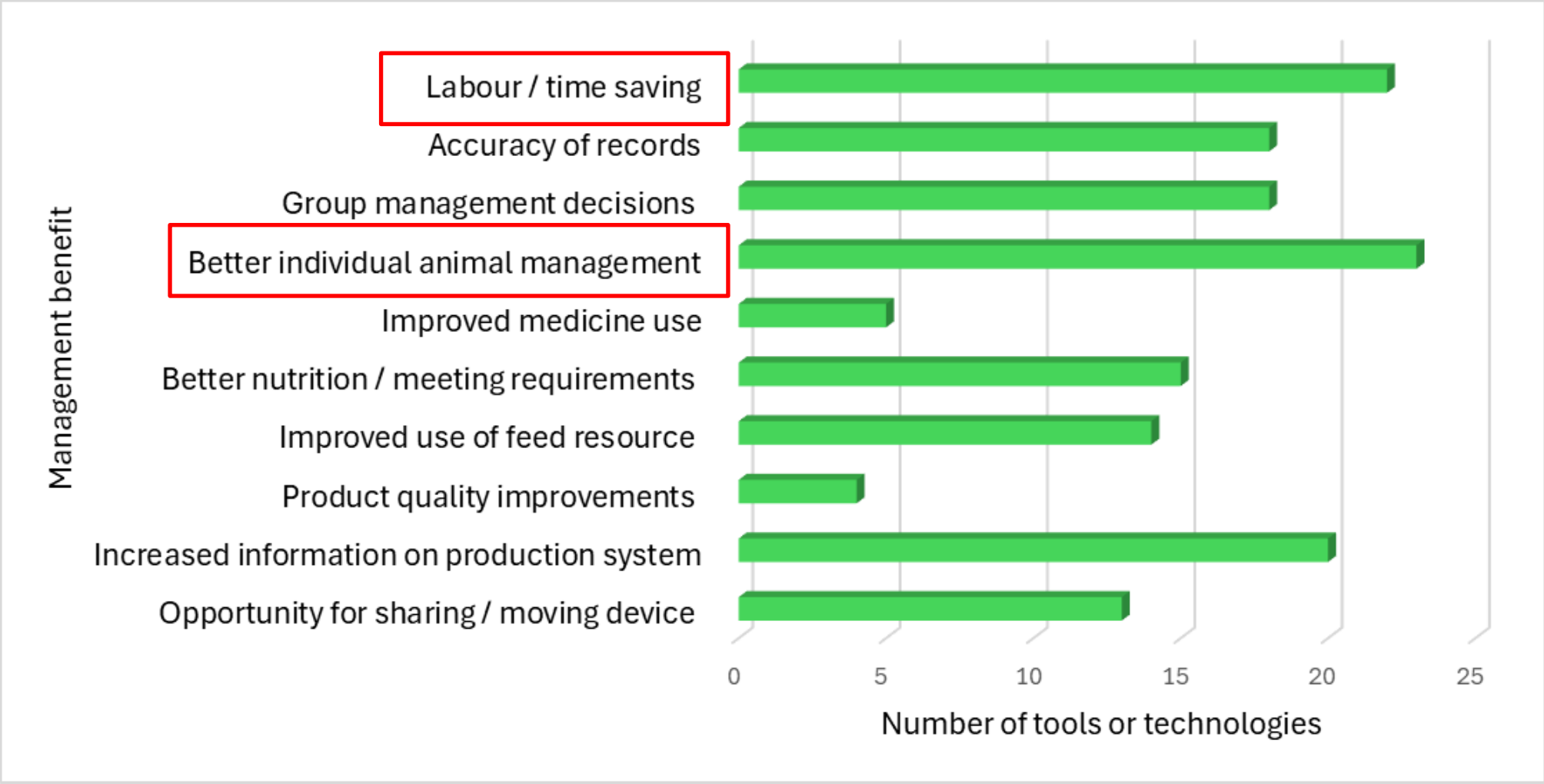
- Training requirements



26 out of 30 technologies

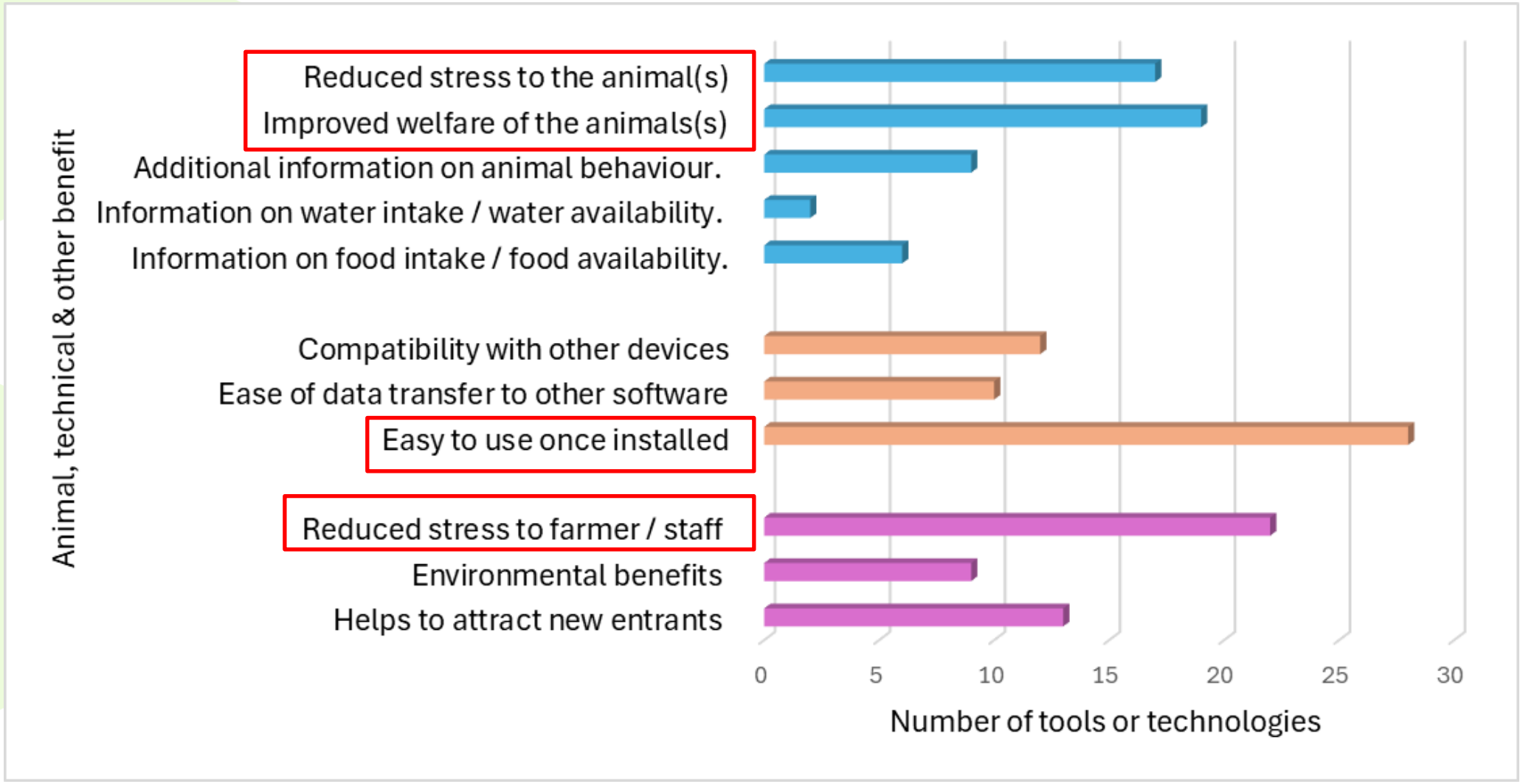
Benefits

- Management



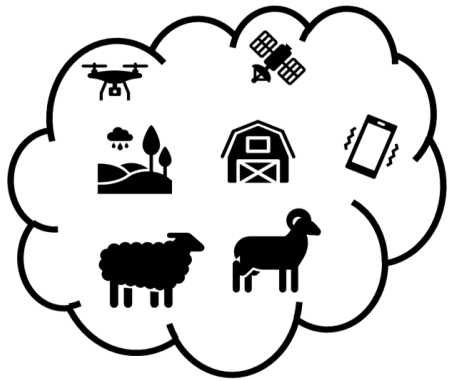
Benefits

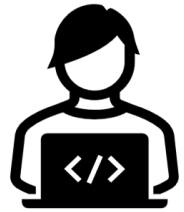
- Animal, technical & other benefits

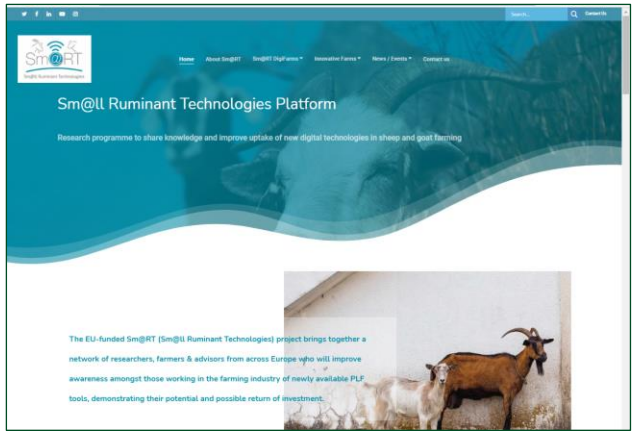


Conclusions

- Innovative tools exist for sheep & goats systems
  - ➢ with many relevant for mountain environments
- Information on costs & benefits is crucial for improving uptake
  - ➢ informed decision making
- Training is still a big issue
- Appropriate for farming needs, systems & budget
  - ➢ 20 out of 30 : good value for money
  - ➢ 24 recommended for other types of small ruminant systems







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