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Sess. 31: Innovations that result in efficient and environmentally friendly farming

Performance of using electronic identification (e-ID) for milk recording in dairy goats

(S.31, #7, p. 242)

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European Regulations on Sheep & Goat ID:

- **Regulation CE 21/2004:**
  - **All S&G shall wear 1 ear tag + 2nd device at >6 mo of age, or before leaving the farm where born, after 9 July 2005...**
  - **2nd device: Chosen by each Member State but e-ID is compulsory if >0.6 Million animals or for international trade in the EU, after 1 Jan 2008.**

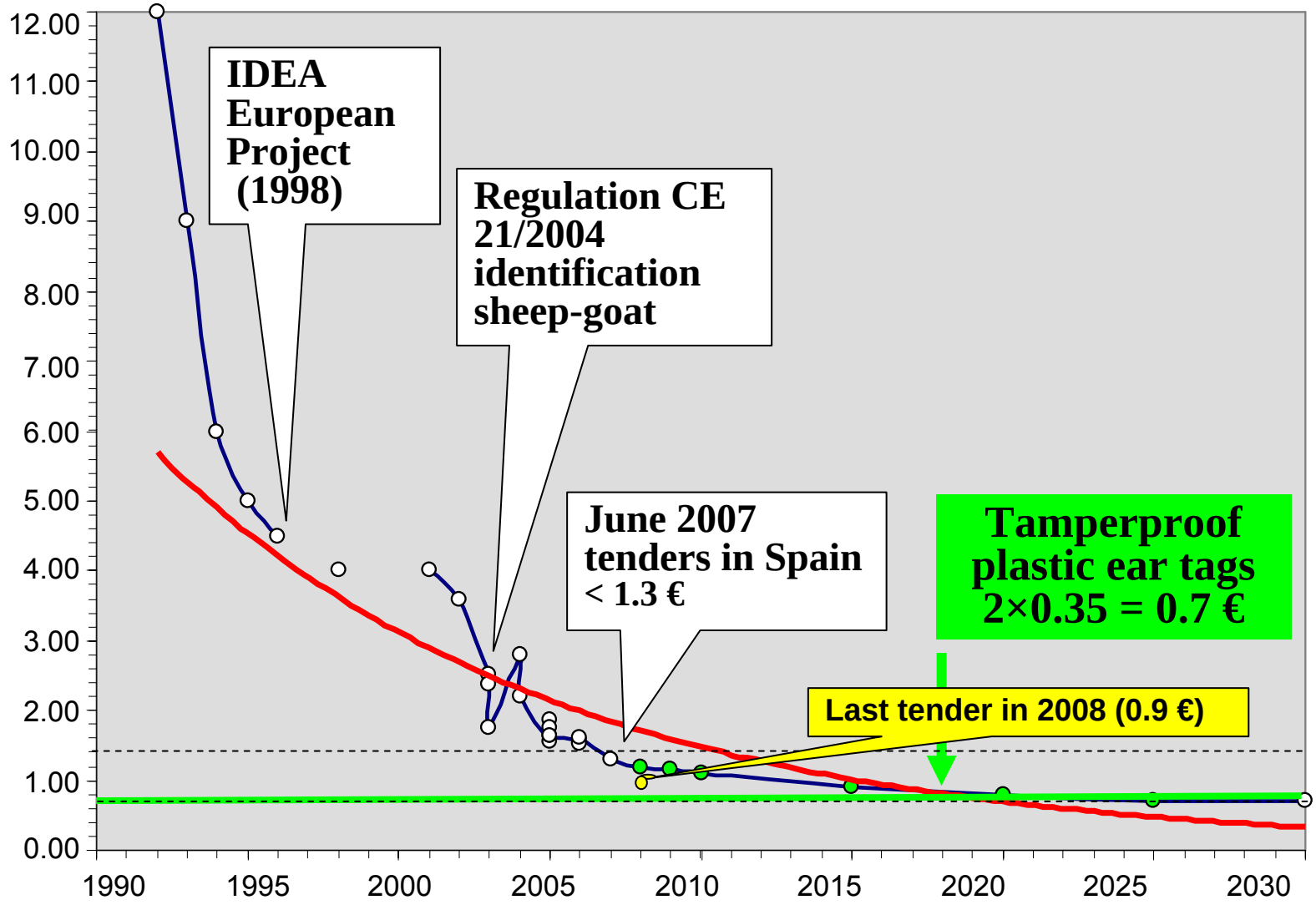
Spain (27 Million): Started in January 2006 (RD 947/2005)

⬇

Ear tag + Electronic bolus (same number)

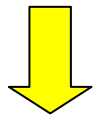
- **Decision CE 1560/2007:**
  - **Compulsory deployment of CE 21/2004 has been delayed 1 Jan 2010?.**

Price of e-ID devices in the European market
(Caja, 2008; historical data and estimations)



Electronic identification (e-ID): Benefits

- **Animal ID System: Primary**
  - **Tamper-proof & permanent ID**
  - **Management of computerized Data Bases**
  - **Animal health programs & traceability**
- **Farm automation: Secondary**
  - **Sorting gates**
  - **Feeding stations**
  - **Flock book management**
  - **Performance recording: Milk, lambing, weighing**
  - **Estrus detection**
  - **Inventory, etc.**



- Reducing labor time & costs
- Improving data management

Objectives

To evaluate the differences in labor time and operational costs of milk recording in dairy goats by 2 systems:

- **Manual (M):** based on the use of visual ID (plastic ear tags)
- **Semi-automated (SA):** based on the use of electronic ID (boluses)

Materials & Methods:

Animals & Management:

- 24 Murciano-Granadina dairy goats
- Milking: once daily in a 2 x 12 stalls milking parlor (Westfalia-Surge Ibérica) with 4 milking units with milk jars by side.
- Data collected for groups of 12 goats during 15 test-days for each milk recording system over a period of 70 d and by the same operator

Materials & Methods:

Manual milk recording system (M):

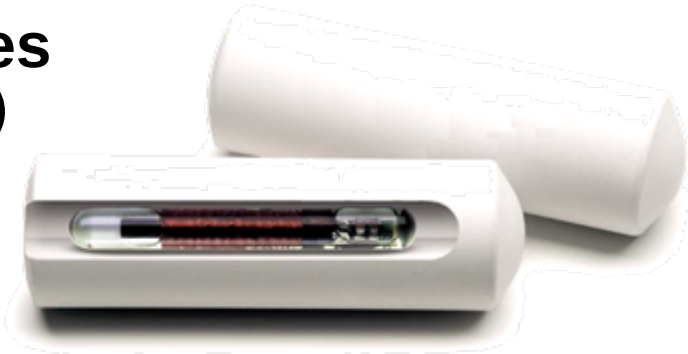
- **Visual ID** by a management ear tag made of plastic, flag type and large size (48 × 38 mm, yellow color; Azasa-Allflex) inserted in the left ear. Manually marked with **1-3 digits of 27 × 10 mm** each (black plastic ink, Allflex Tag Pen, Dallas, TX) for easy reading
- Data recording by writing on **paper forms**
- Data uploading to computer by **manual typing**

Materials & Methods:

- **Semiautomatic milk recording system (SA):**
  - **Electronic ID** (e-ID) by **ceramic boluses** of **75 g** (21× 68 mm, Rumitag, Barcelona) with an ISO glass encapsulated HDX transponder (32 × 3.8 mm), marked with a 16 digit serial code (including ICAR manufacturer codes: 964, Rumitag, n = 18; 983, Tiris, n = 6) and the animal ID code (12 digits).
  - Data recording by typing on the **handheld reader keyboard**
  - Automatic data uploading to computer by **Blue-tooth**
- **Data error and cost-benefit evaluation**
- **Statistical Analysis:** ANOVA using PROC GLM of SAS (v.9.1).

e-ID devices & reading equipment

Electronic boluses
(75 g, 21× 68 mm)

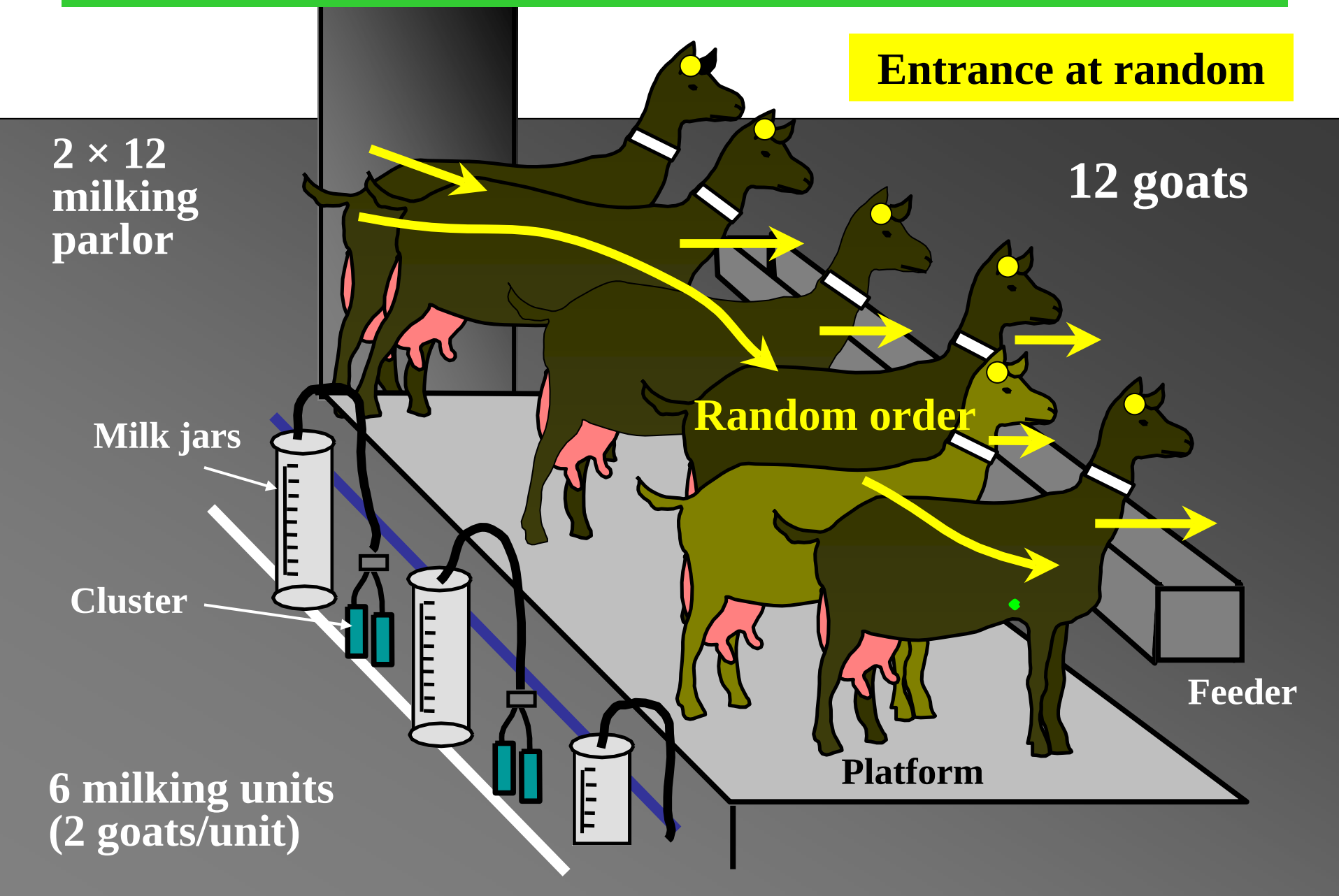


Glass encapsulated transponder (32 × 3.8 mm)

Handheld reader (transceiver)

Stick antenna

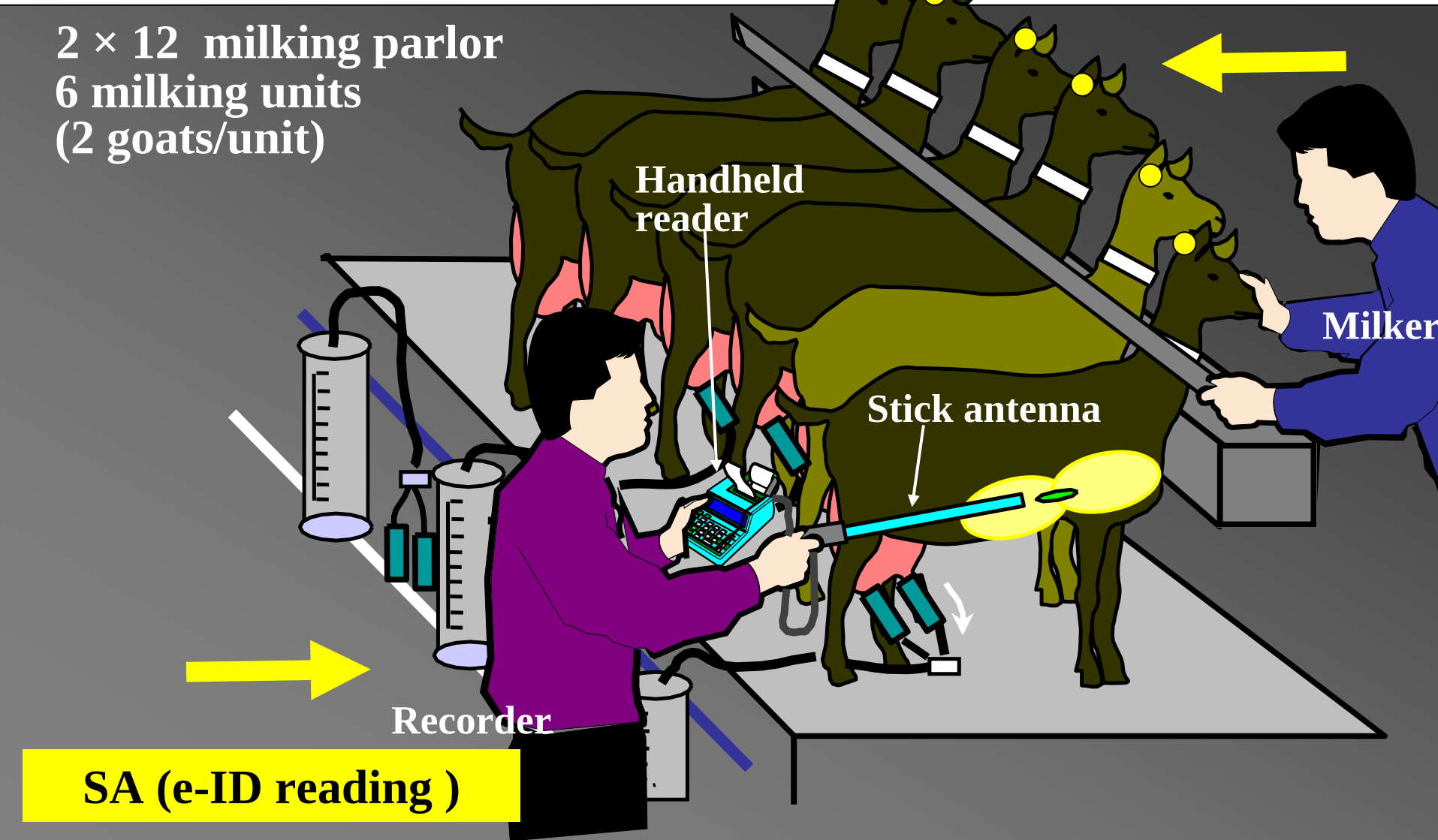
Milk recording procedure (1/4): entrance



Milk recording procedure (2/4): goat ID

Head locking & goat ID

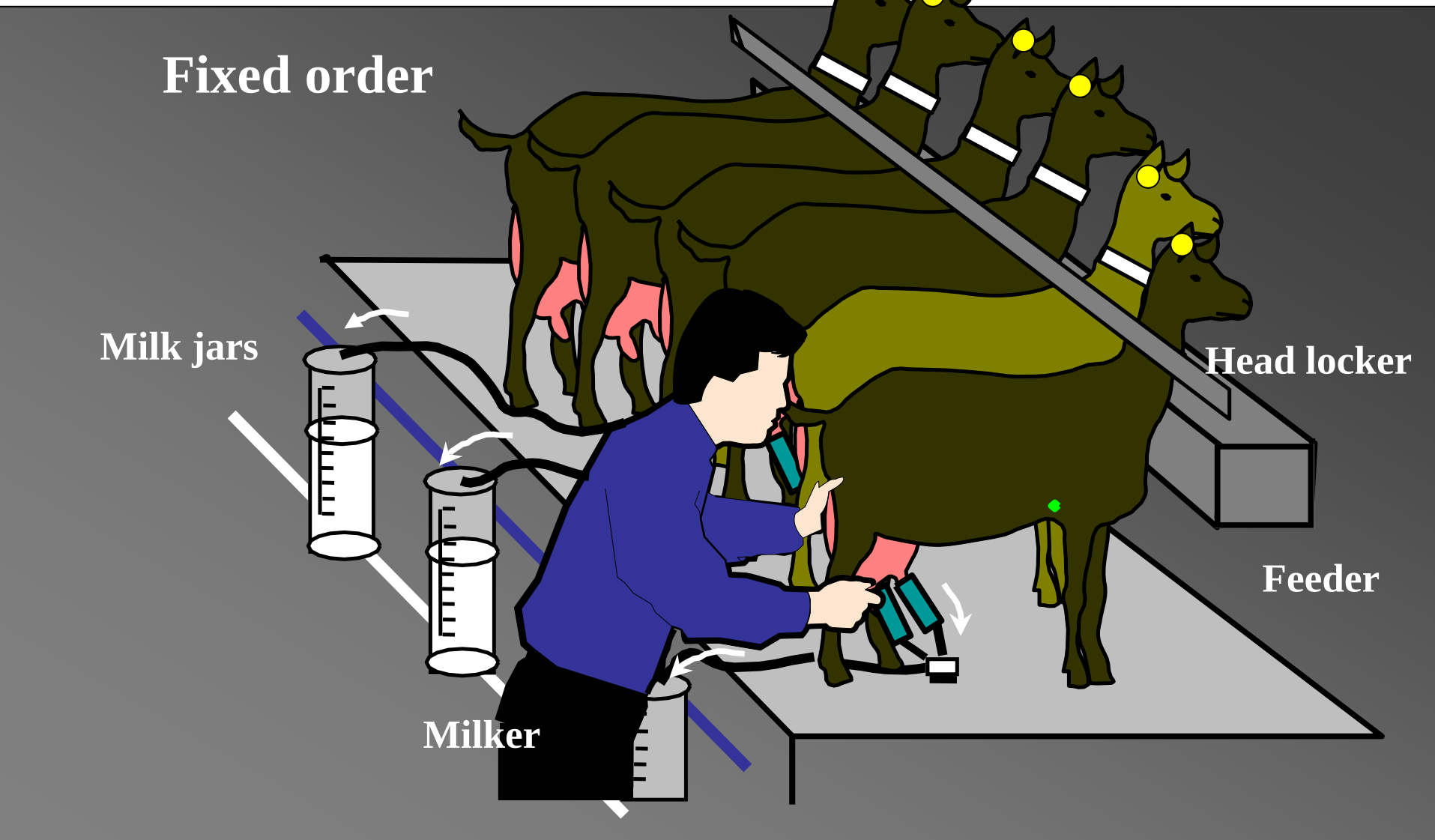
M (Visual ID reading)



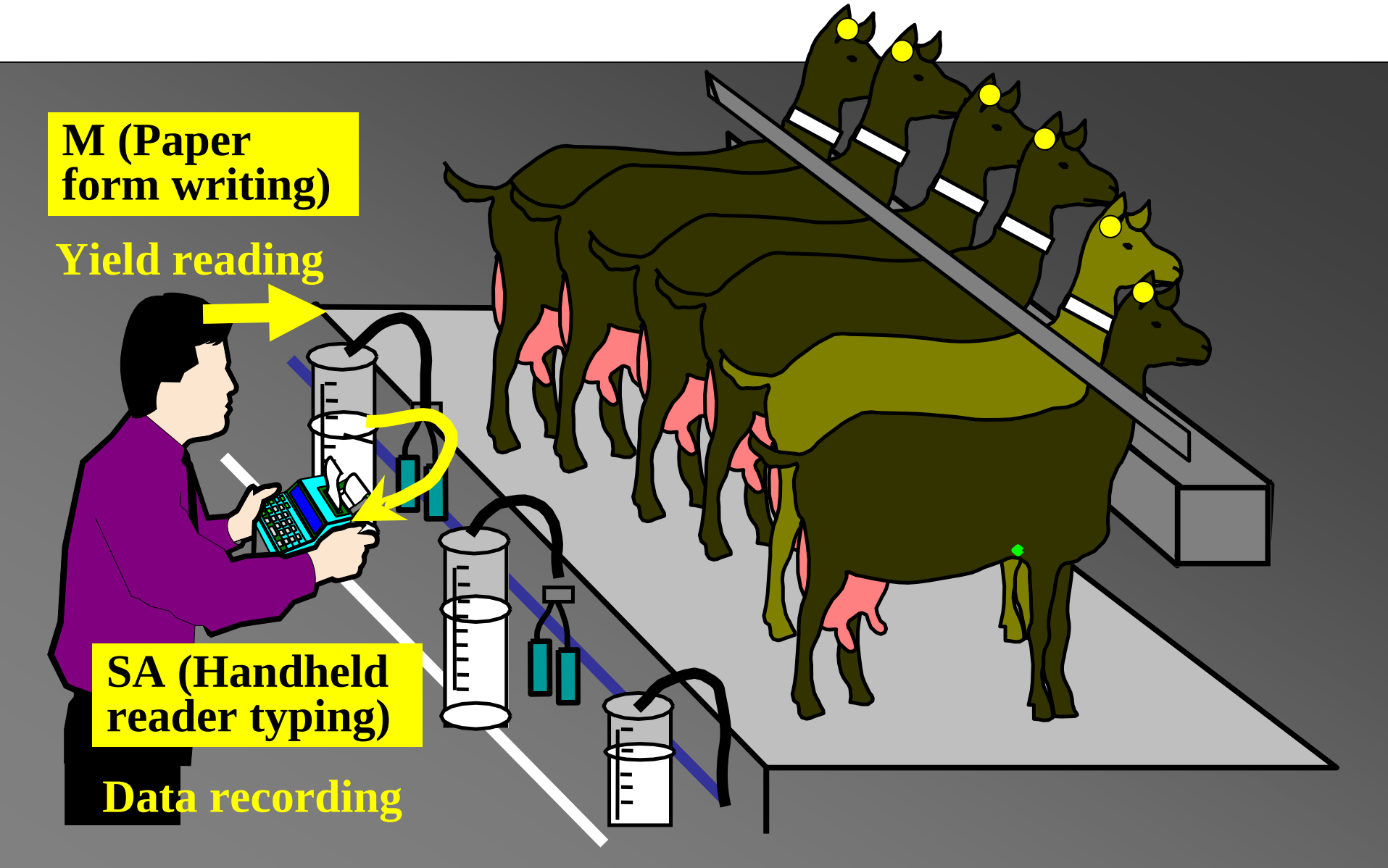
SA (e-ID reading)

Milk recording procedure (3/4): milking

Cluster attachment & milking



Milk recording procedure (4/4): recording



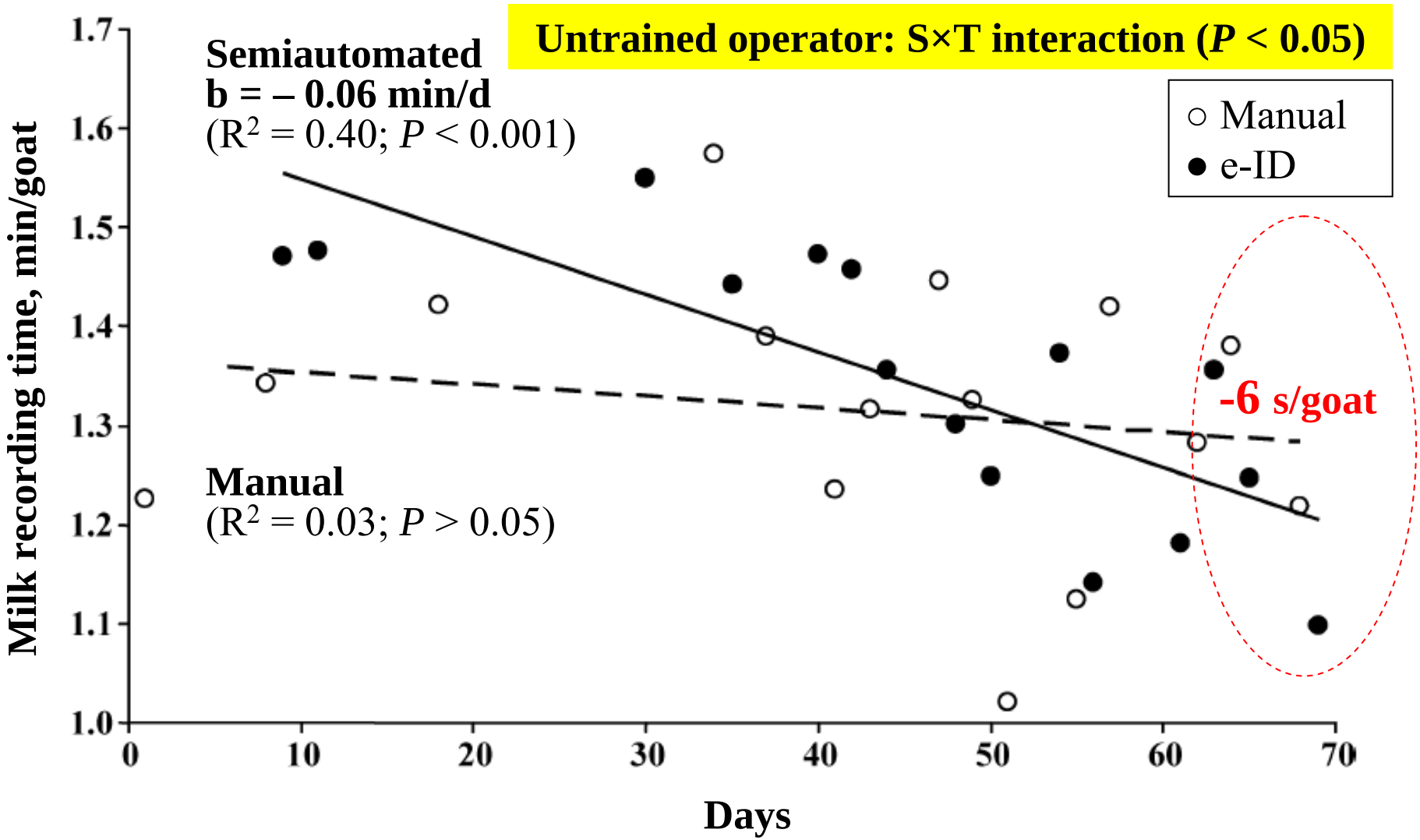
Comparison of manual and semiautomated milk recording systems in dairy goats

Item	Milk recording system		
	Manual	Semiautomatic	*P*
Records, n	360	360	—
Milk yield per goat, L/d	1.91 ± 0.04	1.94 ± 0.04	0.156
Milk rate at recording, L/min	1.45 ± 0.03	1.46 ± 0.04	0.539
Group record. time, min/24 goat			
Milk recording	31.45 ± 0.60	32.16 ± 0.69	0.505
Data transfer	4.81 ± 0.34	1.09 ± 0.10	0.001
Overall	36.26 ± 0.91	33.25 ± 0.91	0.011
Unitary recording time, min/goat			
Milk recording	1.32 ± 0.03	1.34 ± 0.03	0.511
Data transfer	0.20 ± 0.01	0.05 ± 0.01	0.001
Overall	1.52 ± 0.04	1.39 ± 0.04	0.002
Errors, n			
Milk recording	2 (0.6%)	2 (0.6%)	—
Data transfer	4 (1.1%)	0	—

Time reduction: 0.13 min/goat (-9%)

Time expressed in a decimal scale (1 min = 100 s).

Manual vs. Semiautomated milk recording systems in dairy goats: System × Time interaction



Comparison of manual and semiautomated milk recording in dairy goats: Herd savings

Milking parlor = 2 × 12 (side-by-side)
Yield = 40 to 200 goats/h
Herd size = 24 to 480 goats
Work wage = 10 €/h

Savings/milk recording:
0.13 min/goat (3.01 min/24 goats)

Savings/milk recording:
0.5 to 12.9 €/recording

Paying back
40% investments

Net costs/milk recording:
0.5 to 12.9 €

Extra cost/milk recording:
1.22 to 24.48 €

Extra costs/milk recording = 0.051 €/goat

e-ID investment
2.2 €/goat

Milk test-days/lactation = 6
e-ID cost = 1.4 €
Goat life span = 5 yr
Reader prize = 400 €
Reader's use = 5 yr
Readings/yr (200 d × 100 goats/d) = 20,000

Conclusions

- **Implementation of SA milk recording system using e-ID boluses in conventional side-by-side milking parlors for dairy goats was simple.**
- **Operator training is required**
- **Use of e-ID in SA milk recording:**
  - **Reduced recording time**
  - **Reduced labor costs**
  - **Improved data accuracy by reducing data uploading errors**
- **Pay back of e-ID investment in the SA system accounted for 40% of extra costs of e-ID**

Thanks for attention!