Milk ejection occurrence before teat cup attachment on milkability of ewes

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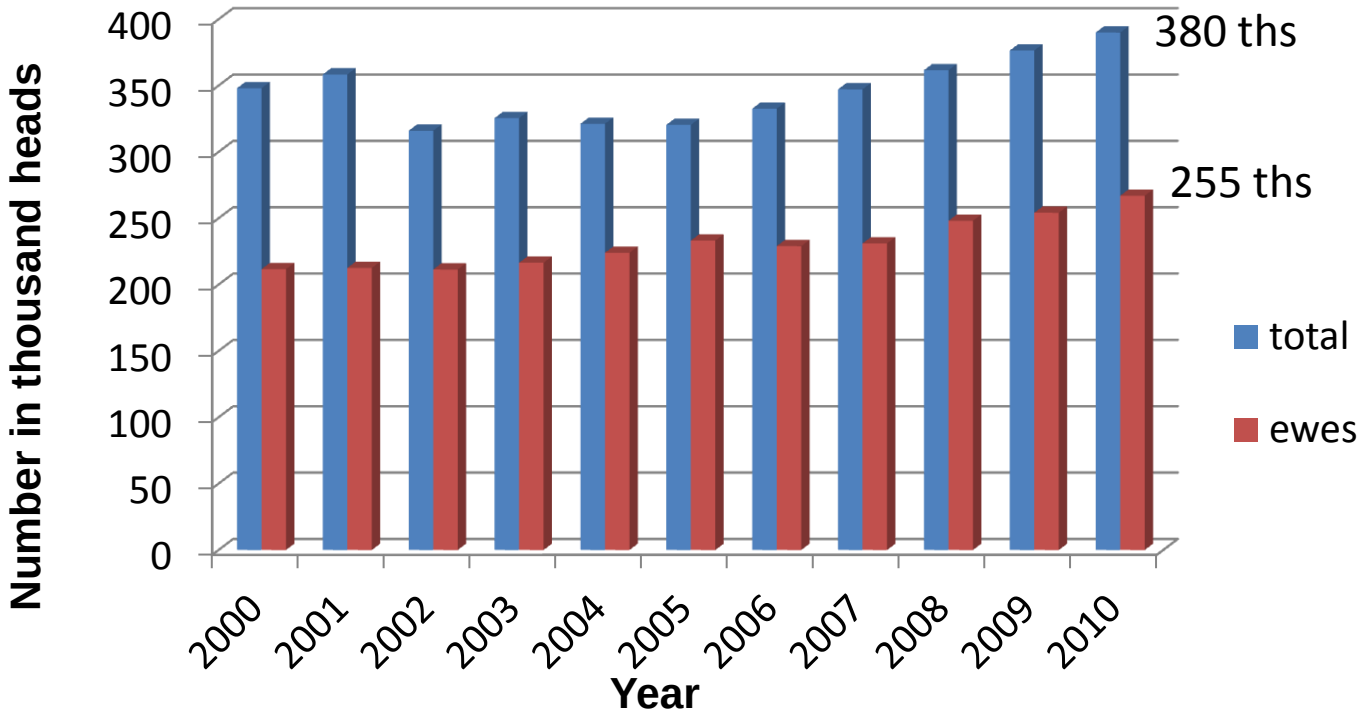
Slovakia

Long tradition of sheep breeding

Permanent grasslands represent
18 % of arable land

Landscape suitable for sheep breeding

Sheep and ewes in Slovakia



In **1989** there were raised **600** ths pieces of sheep and **355** ths of ewes in country.

Mostly local breeds are kept:

up to 200 ths heads are ewes of Tsigai and Improved Valachian, and the crossbreds of Tsigai or Improved Valachian with imported breeds.

Characteristic of situation

Milking frequency - two or three time daily

Hand milking - rapidly decreased in dairy practise

Labour deficiency

Increasing of milk production

Increasing number of farms with machine milking

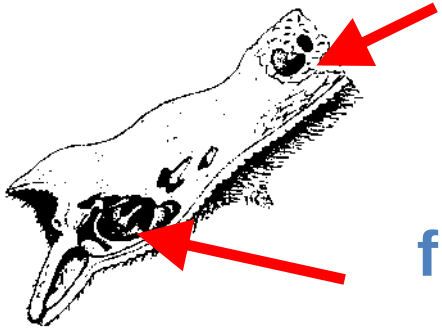
- most often systems used:

paraller 2 x 24-28 parlours

Milking routine

Applied research is required

Milk distribution in udder

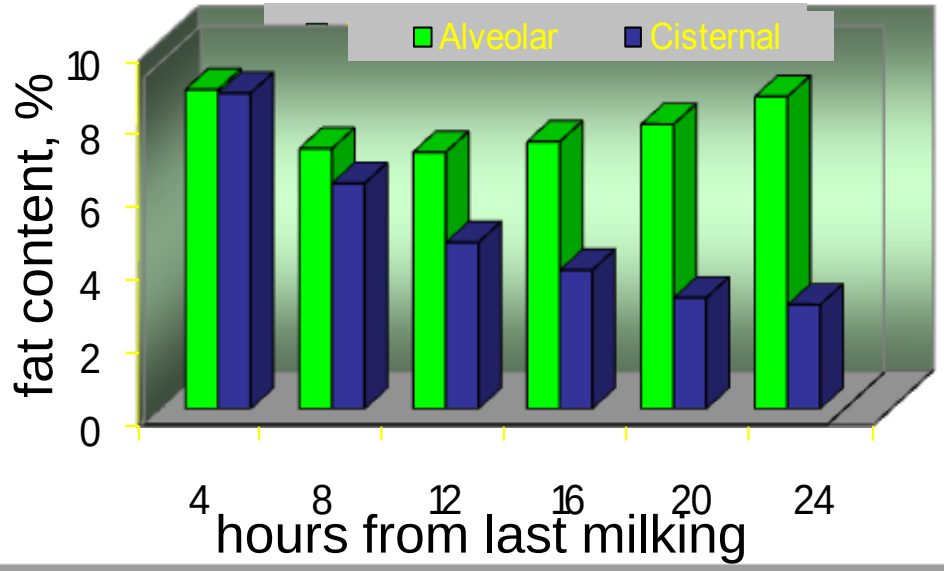


fixed milk - alveolar

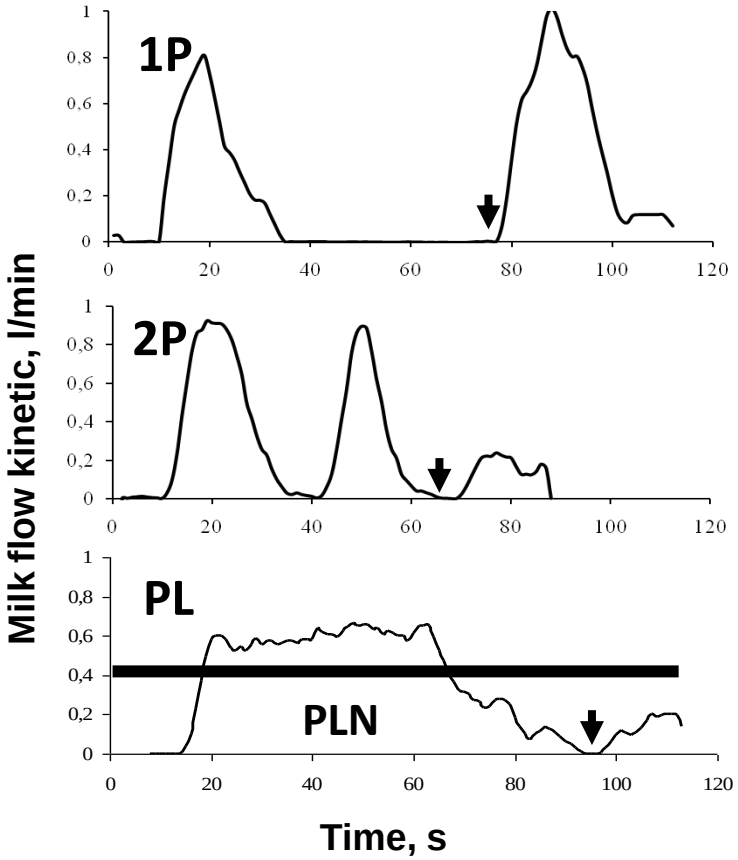
30%

free milk - cisternal

70%



(McKusick et al., 2002)



Stripping

Stability of milk flow

Short period

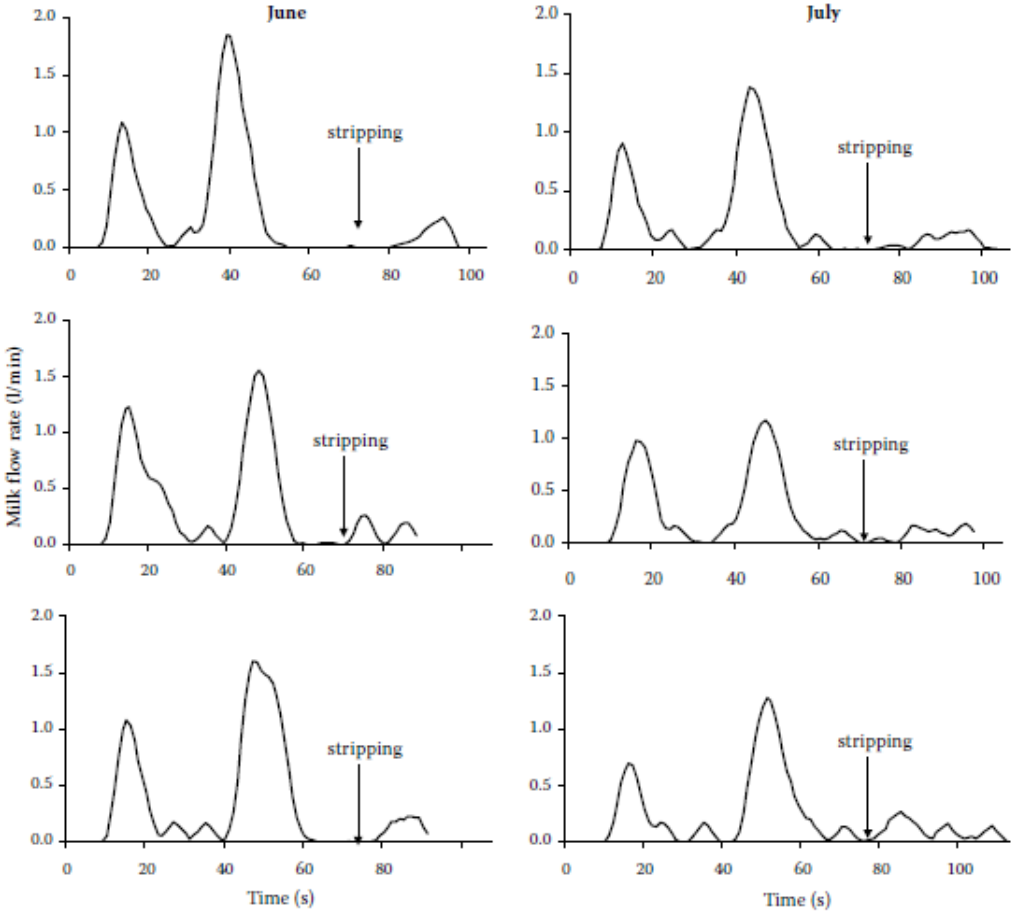
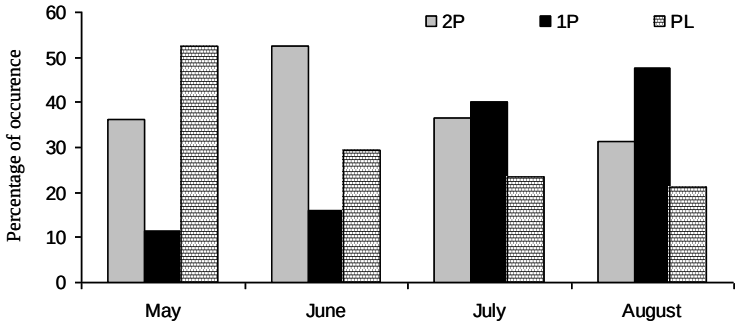


Figure 1. Example of Improved Valachian ewe with stabile milk flow curves (2P) during three consecutive milkings in two months of experiment

Mačuhova et al., 2012

Long period



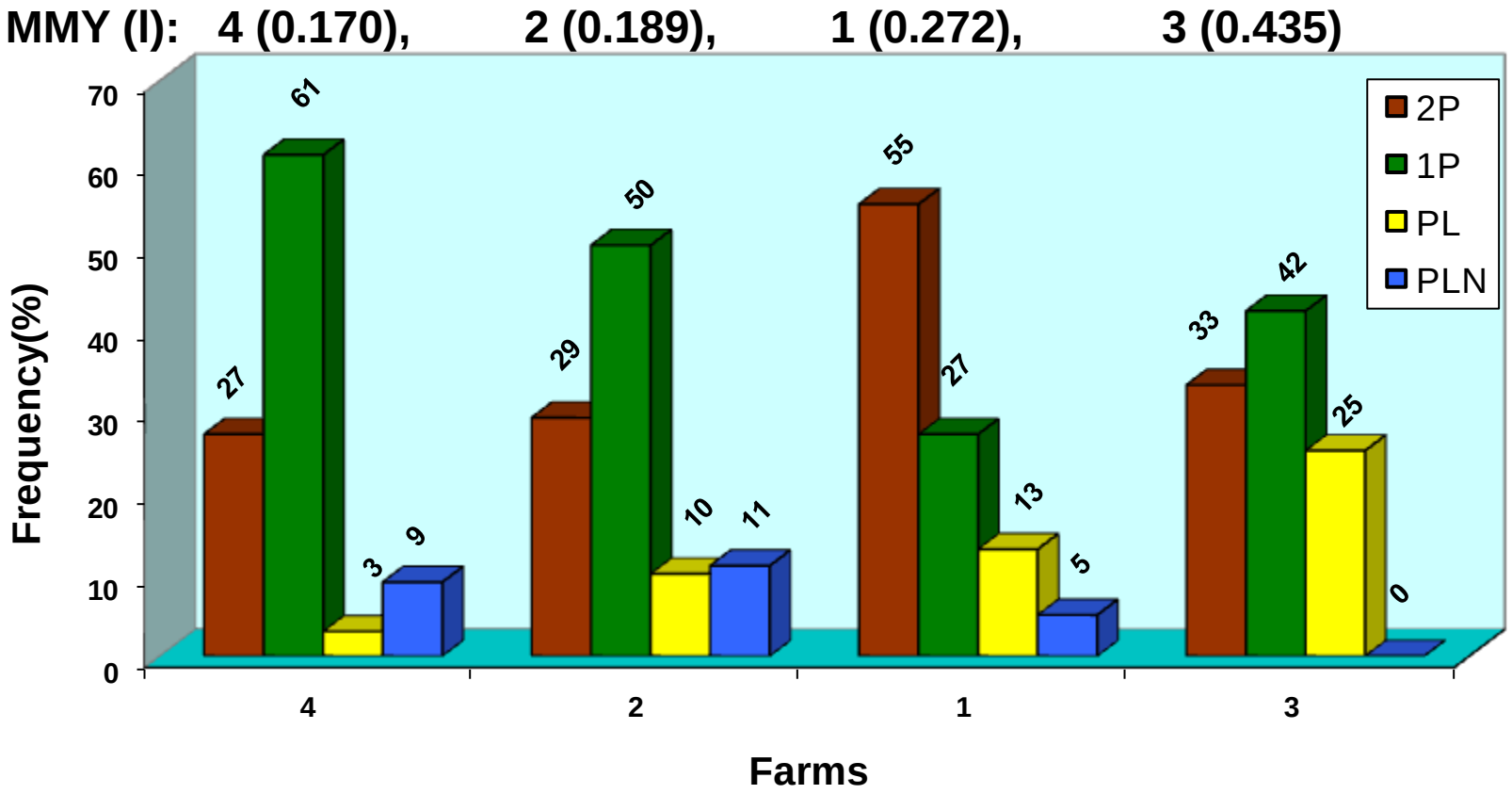
Tancin et al., 2011

Before milking

After milking

Frequency of milk flow curves occurence

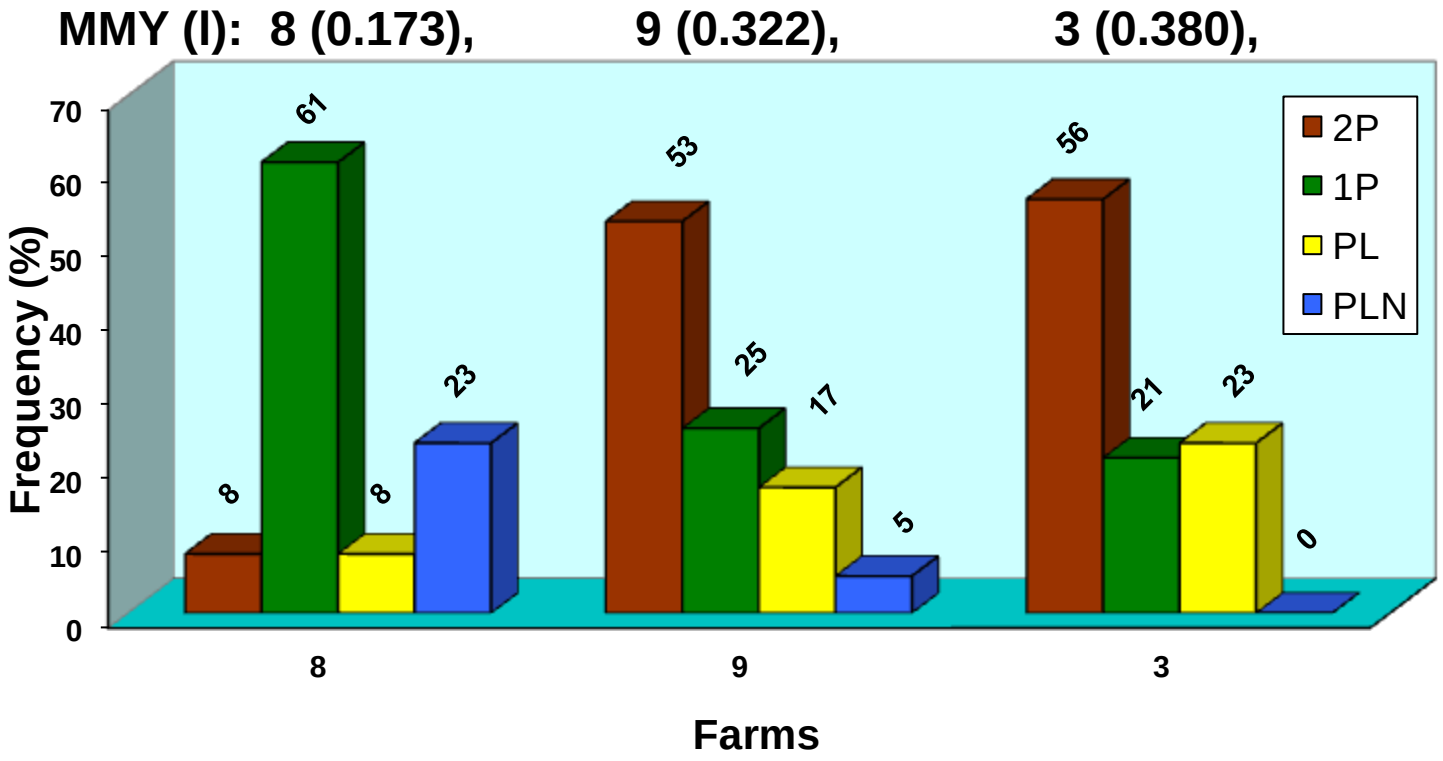
Tsigai



Kulinová et al., 2011

Frequency of milk flow curves occurence

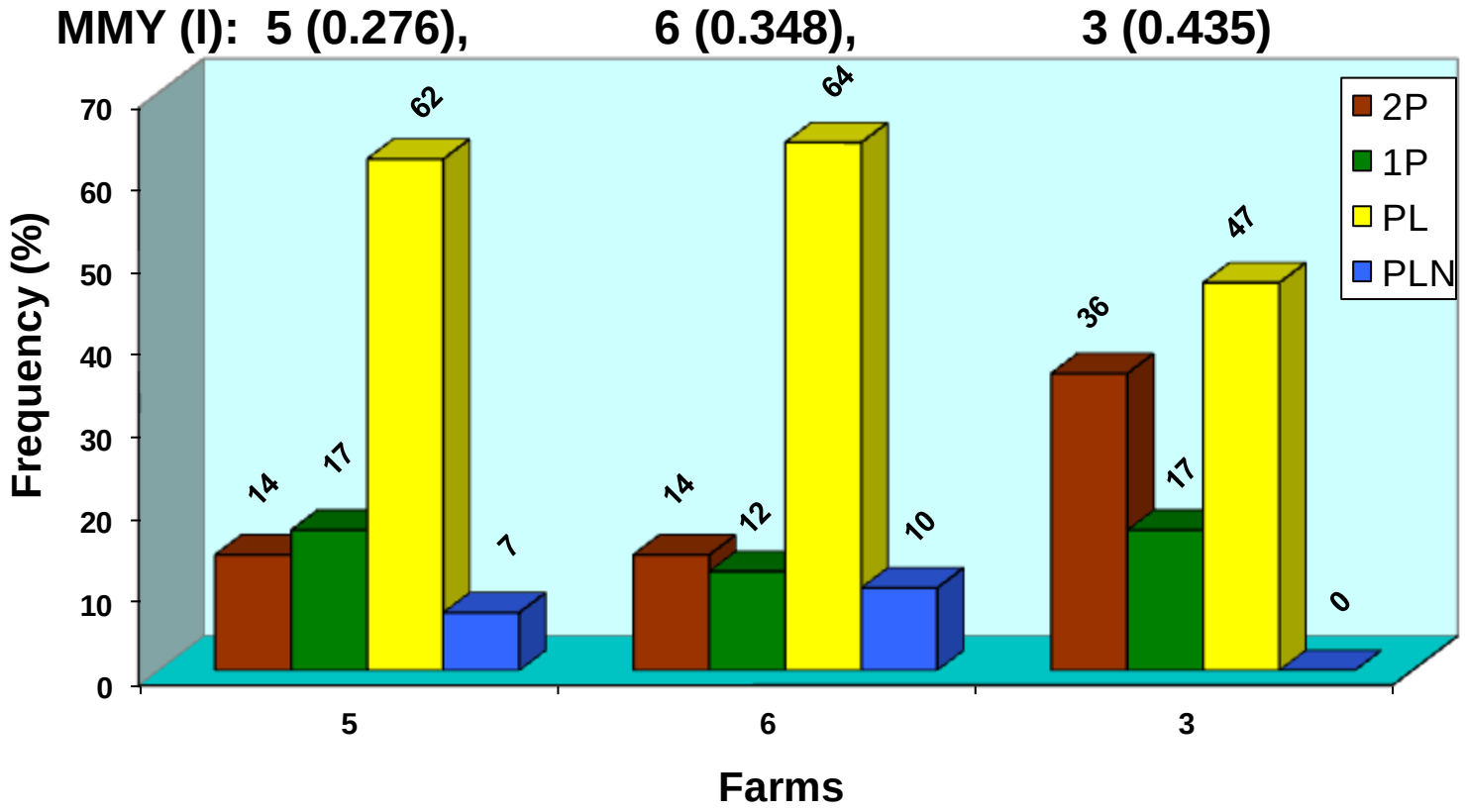
Improved Valachian



Kulinová et al., 2011

Frequency of milk flow curves occurence

Lacaune



Kulinová et al., 2011

Experiment

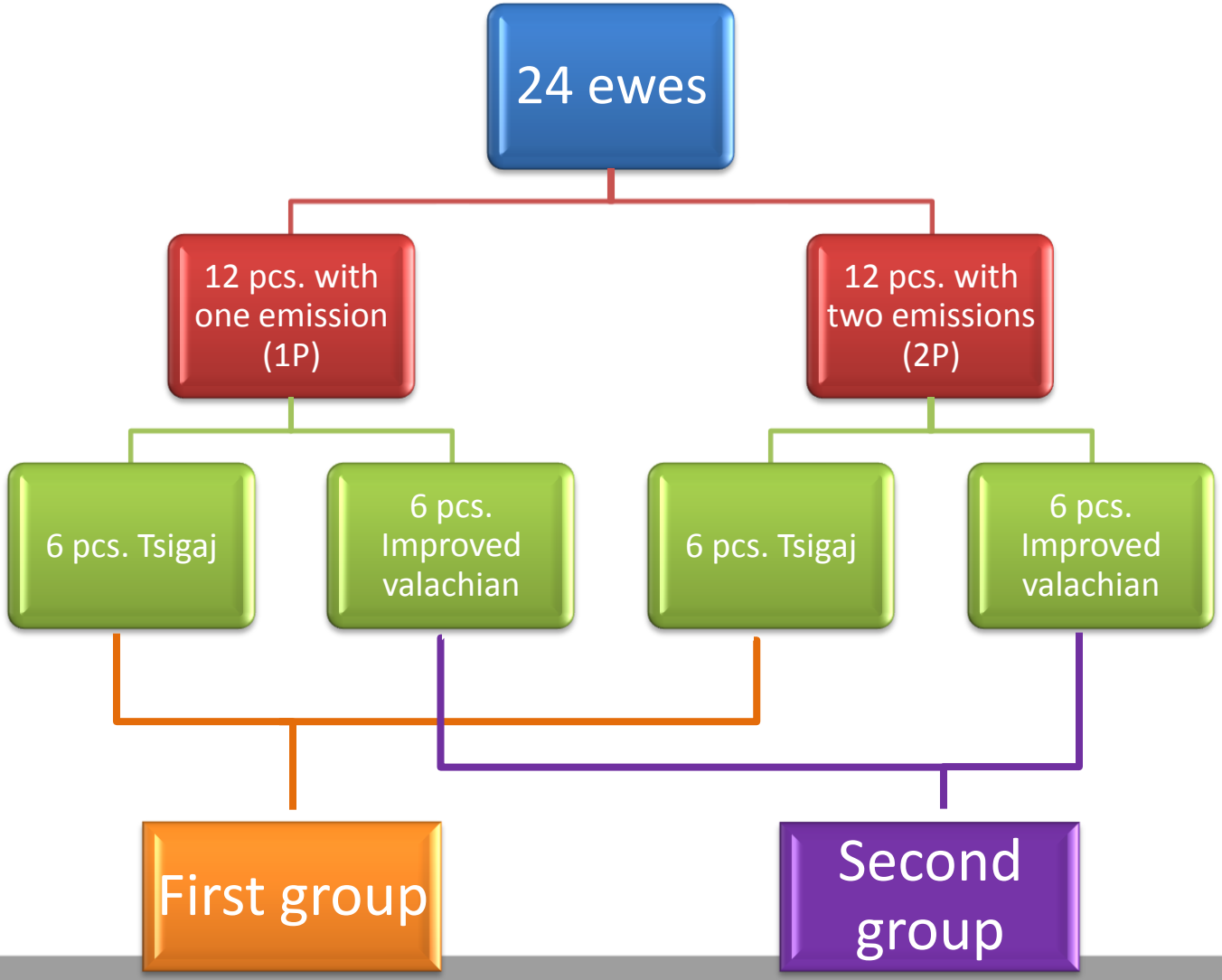
Aim

- describe the importance of milk ejection before cluster attachment on milk flow patterns, milk composition and other parameters of milkability related to milk flow kinetic

Hypothesis

- pre-stimulation before cluster attachment will differently influence milkability and milk composition in ewes differed in milk flow pattern (1P vs. 2P) during control milking – higher fat content and milk yield in 1P ewes only

Material and Methods



Material and Methods

1st milking

First group - 5 IU oxytocin *i.m.*

Second group - physiological saline *i.m.*

2nd milking

First group - physiological saline *i.m.*

Second group - 5 IU oxytocin *i.m.*

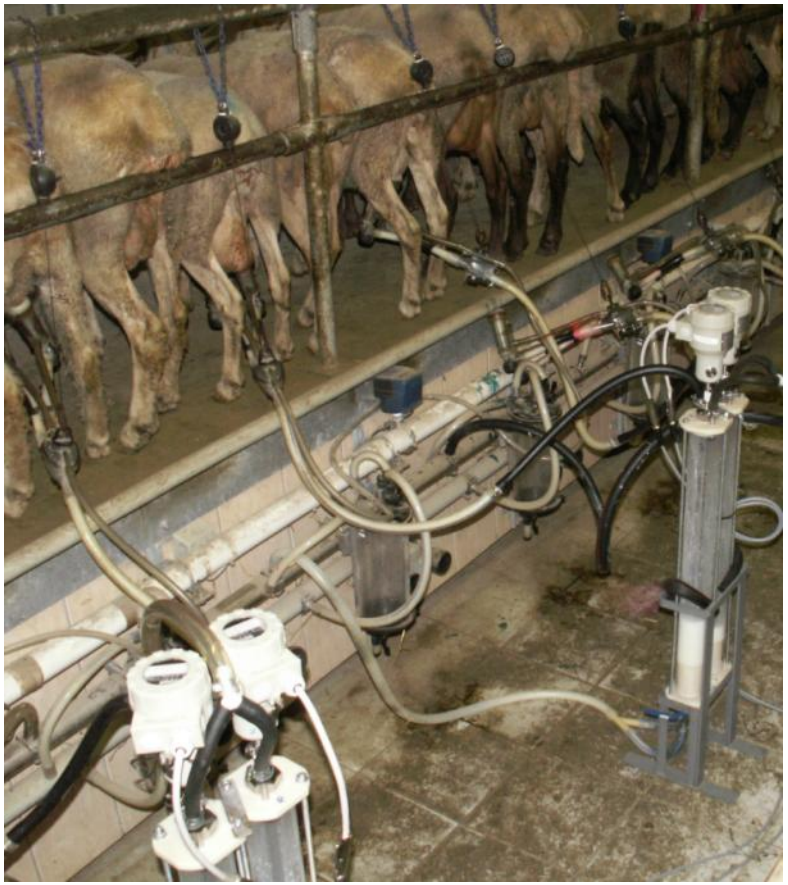
Statistical analysis

t-test of dependent samples – comparison of milkability parameters and milk composition between treatments within each group

t-test of independent samples – comparison between the groups within treatment

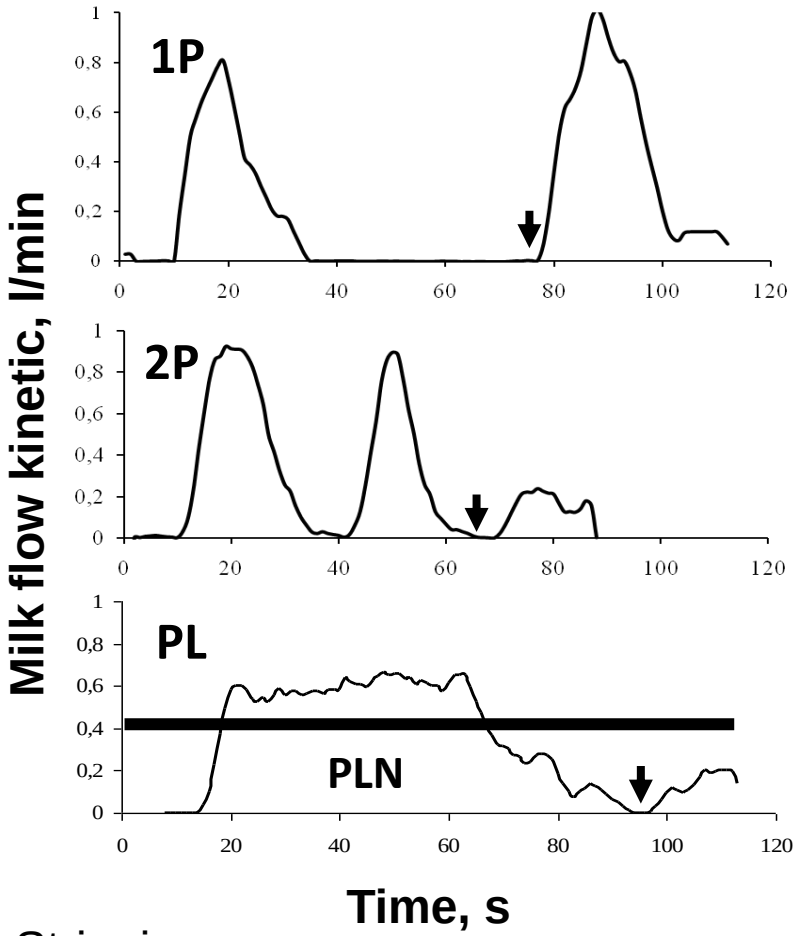
Material and Methods

During milkings, an actual milk yield was recorded in one - second intervals using a graduated electronic milk collection jars.



(NIVOTRACK; NIVELCO Ipari Elektronika Rt, Budapest, Hungary)

Material and Methods



Stripping

Results

Milkability parameter	1P				2P			
	Saline		Oxytocin		Saline		Oxytocin	
	Mean	STD	Mean	STD	Mean	STD	Mean	STD
TMY[l]	0.19 ^{aA}	0.06	0.24 ^{B}	0.07	0.29 ^{b}	0.07	0.28	0.06
MMY [l]	0.08 ^{aA}	0.06	0.13 ^{B}	0.07	0.18 ^{b}	0.06	0.17	0.06
SMY [l]	0.11	0.08	0.11	0.08	0.11	0.02	0.11	0.04
SMY %	55.49 ^{a}	26.35	45.90	22.99	37.87 ^{b}	8.07	38.37	14.33
MT [s]	44.27	32.97	35.45	34.76	54.55 ^{A}	24.46	27.00 ^{B}	11.66
MFL[s]	34.36	37.94	24.18	41.47	11.27	2.20	11.00	2.28
MMFR [l.min^{-1}]	0.52 ^{A}	0.41	0.78 ^{B}	0.43	0.80 ^{A}	0.45	1.12 ^{B}	0.50
TMMFR [s]	18.55	17.74	14.73	5.42	18.82	11.89	14.91	2.39
MY30S [l]	0.06 ^{A}	0.06	0.10 ^{B}	0.06	0.09 ^{A}	0.06	0.14 ^{B}	0.06
MY60S [l]	0.07 ^{aA}	0.06	0.12 ^{B}	0.07	0.15 ^{b}	0.06	0.16	0.07

Averages in the same line with different letters are different:
^{a,b,} Between the groups within treatment; $^{A, B}$ Between treatments within group

Results

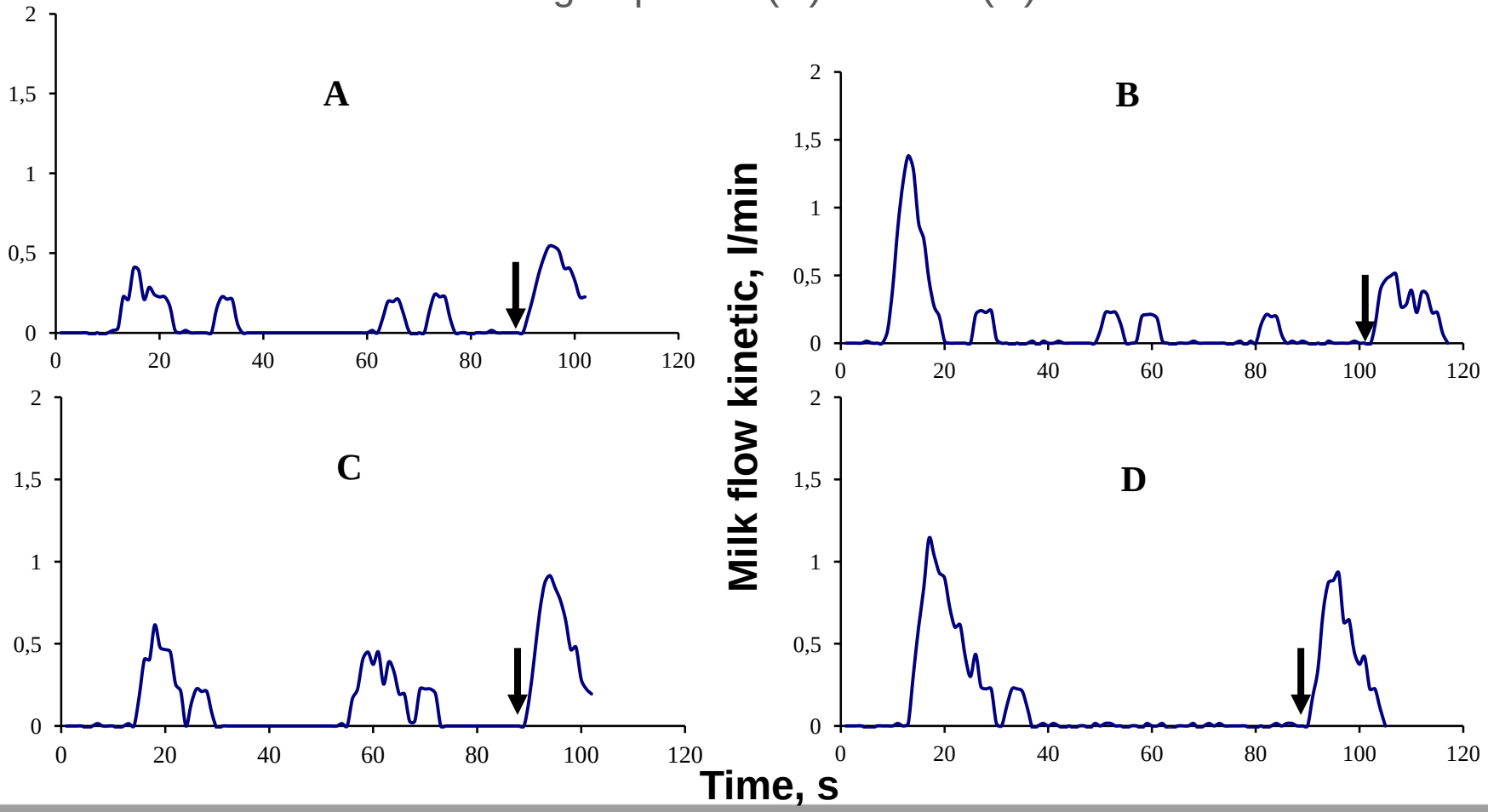
Milk composition	1P				2P			
	Saline		Oxytocin		Saline		Oxytocin	
	Mean	STD	Mean	STD	Mean	STD	Mean	STD
Fat [%]	8.63	0.74	9.29	0.81	8.31	0.92	8.75	0.92
Total fat content [g]	17.02 ^{aA}	4.95	22.91 ^{B}	7.97	25.19 ^{b}	6.71	25.17	5.41
Protein [%]	5.86	0.67	5.82	0.58	5.48	0.51	5.51	0.58
Lactose [%]	4.66	0.19	4.68	0.17	4.75	0.22	4.73	0.22
Fat-free solid [%]	11.41	0.77	11.39	0.55	11.08	0.41	11.10	0.53
Solid [%]	19.79	1.18	20.40	0.96	19.16	1.08	19.55	1.23
SCC (ln_x)	11.64	1.01	11.75	1.03	11.00	0.83	11.07	0.88
Total milk yield [l]	0.19 ^{aA}	0.06	0.24 ^{B}	0.07	0.29 ^{b}	0.07	0.28	0.06

Averages in the same line with different letters are different:
^{a,b,} Between the groups within treatment; $^{A, B}$ Between treatments within group

Results

Examples of different milk flow pattern of the same ewes during machine milking first from 1P and second from 2P group.

ewe from 1P group – SA (A) and OT (B) treatments,
ewe from 2P group – SA (C) and OT (D) treatments.



Conclusion

milk ejection reflex before cluster attachment:

ewes with two emission:

no influence on milk composition

didn´t change milk yield

change milk flow curves to one peak with higher MMFR

ewes with one emissions:

increased total fat content

increased milk yield and maximal milk flow rate

Milk ejection reflex has a high impact on the milk composition and on complete and fast milk removal


Thank you for your attention