Artificial Insemination of Milk Ewes with Refrigerated Semen-Portuguese Experience

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The 2nd CZU Prague Hybrid Seminar

Animal reproduction, sperm cryopreservation analysis: an international experience

Prague

3-4 May 2023

Serra da Estrela

Saloia

Merino


28 11:35


4 12:00


11 10:40


4 11:50


4 11:58

Semen Evaluation parameters in artificial insemination schedules

Volume

Concentration

Mass motility

Individual Motility

Live sperm

Normal Sperm


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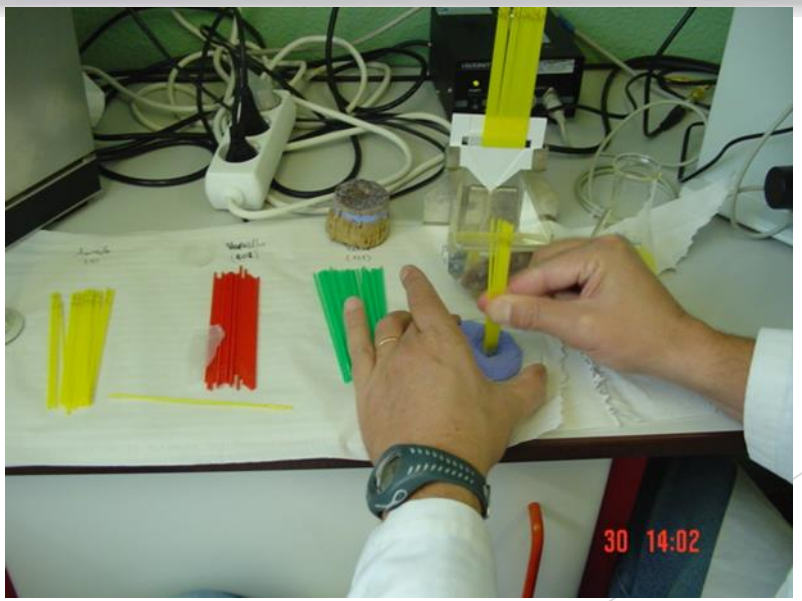
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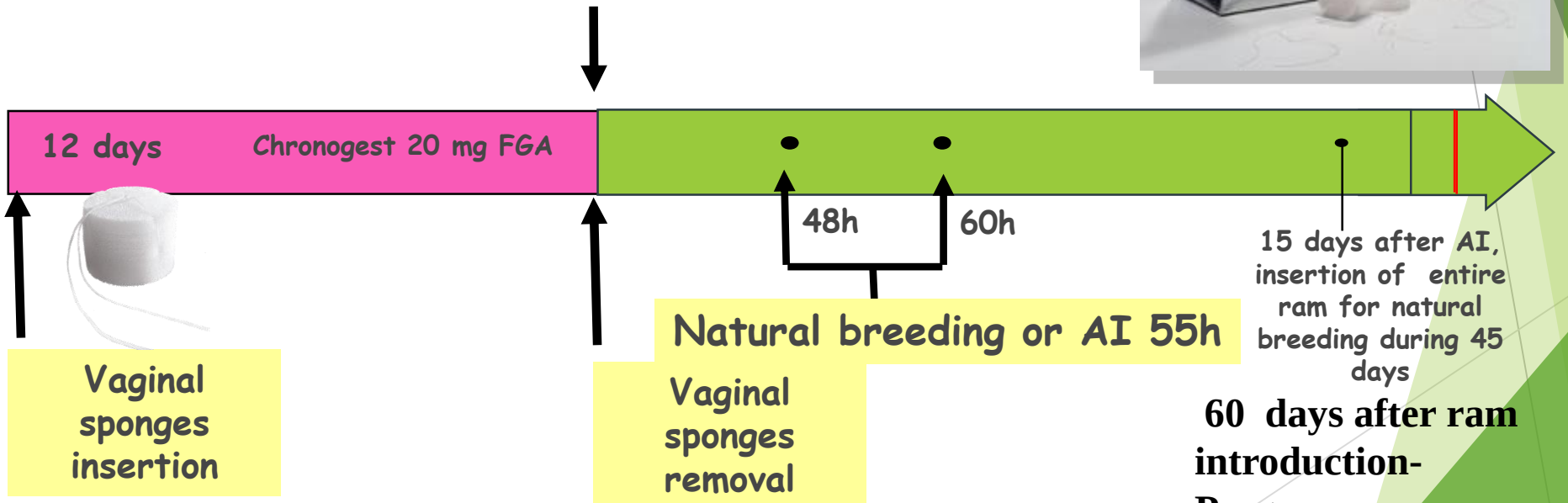
Semen Evaluation

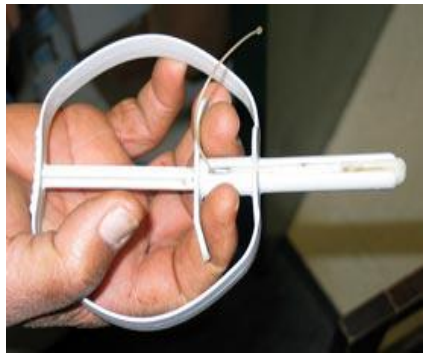
Estrous Synchronization Protocols: AI or Natural breeding

Minimal Interval between lambing and sponge insertion- 60 days

eCG injection 300 a 500 UI



Estrous synchronization: Vaginal sponges (FGA) and CIDR (progesterone)

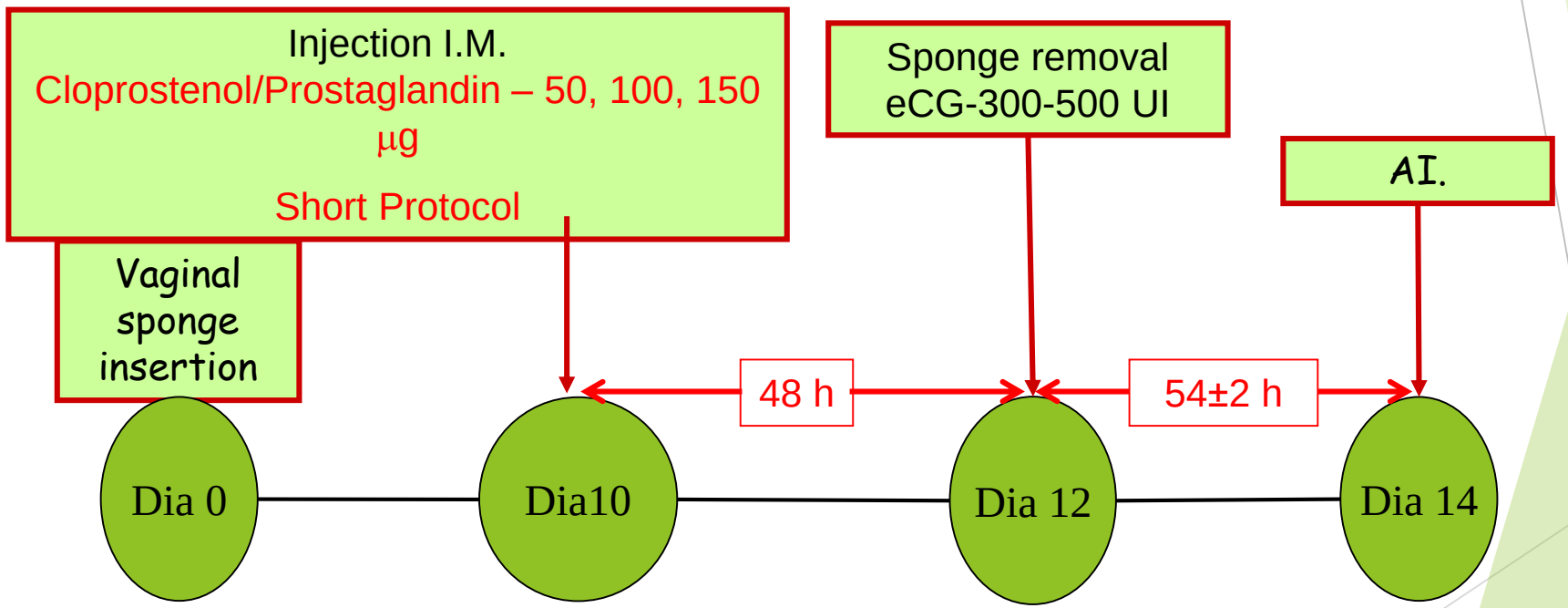


CIDR: Progesterone, 300 mg

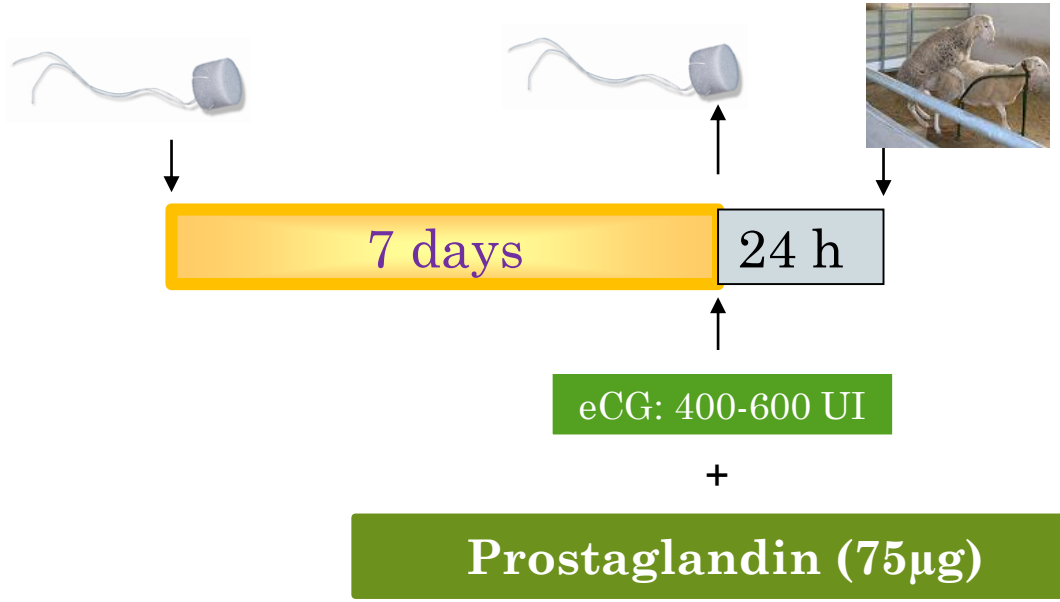
Vaginal Sponges : FGA (20 mg) or MAP: 60 mg

Estrous synchronization and native ewe artificial insemination (AI) protocol

Progestagen sponges (20 mg FGA)



Short Protocol: Vaginal sponges-Prostaglandin F2α



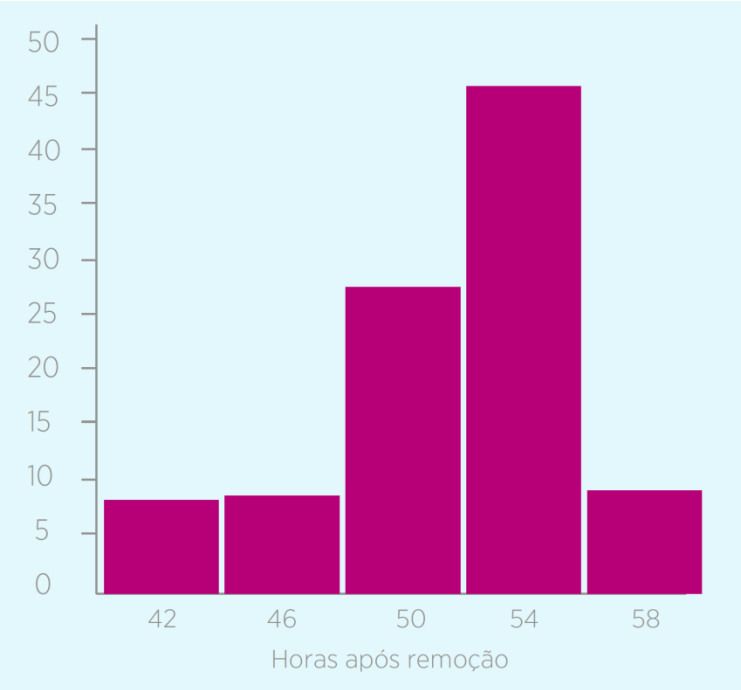
- Almost half duration of sponge staying
- Higher number of estrous synchonized groups;
- Natural breeding from 24h
- Articial insemination 53 -55 h

Synchronization protocol

CIDR Ovis (300 mg P4) – 12 days — 1-2 days — Estrous

eCG
250-600 UI

Ovulations (%)



- ✓ Until 58h
- ✓ 73% between 50 and 54h

Suitable for AI schedules

MINISTÉRIO DA AGRICULTURA, DO MAR, DO AMBIENTE

TIMING OF OVULATION IN EWES POST REMOVAL OF A PROGESTERONE DEVICE (CIDR® OVIS) AND INJECTION OF ECG.

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Presented at the 9th International Sheep Veterinary Congress, 22-26 May 2017, Harrogate, UK

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Some schedules

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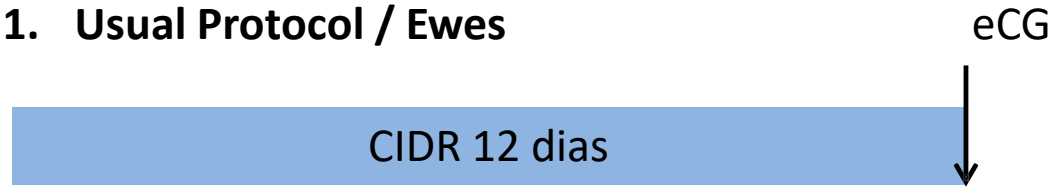
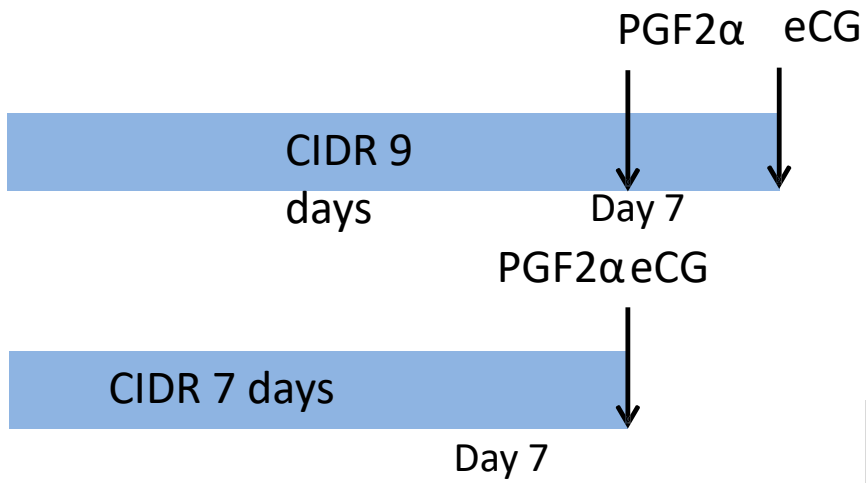
1. Usual Protocol / Ewes



AI- 52 Hours

2. Shorter protocols



AI- 48 hours

- ✓ **Ram introduction between 42 e as 48h**
- ✓ Usuallly in ewe milk explotations- 50/70 ewes/group)
- ✓ Controlled breeding
- ✓ 2 Mounting per ewe. 12 hours interval
- ✓ 17 days later- Ram reintroduction
- ✓ In less favourable seasons: ram melatonin (2) implants

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Equipment- Cervical AI

Cervical AI: Exocervical Route

Cervical AI / Ewes

Merino Ewe Cervix

Fertility , prolificacy and e fecundity in two ewes groups (SE Breed): 250 e 500 UI of eCG at sponge removal

eCG	n	Fertil (%)	Prolific (%)	Fecund (%)
250	25	62.5	140	87.5
250	25	47.37	144.4	68.4
	50	**51.8**	142.8	74.07

AI in Saloia breed with RS: Effect of extender type on fertility

AI (n)	Extender	Fertil. (%)
141	Milk	39[a]
155	Tris	28[b]
296		**33**

a*vs***b**-P<0,066

AI with RS in Saloia breed : Ram variation (fertility)

Rams	AI (n)	Fertility (%)
801	14	42.86 ab
804	27	22.22 a
805	16	31.25 a
902	31	61.29 b
906	7	28.57 ab
Todos	95	**40.0**

ANOVA, $F_{[4;90]}=2.75$; $P<0.03$

AI in with RS in SE ewes; effect of oxytocin on reproductive parameters (%)

Group	Fertil (%)	Prolif (%)	Fecund (%)
Oxitocin	**38.1**	175	66,67
Control	**46.15**	216.6	100
Total	**41.18**	192.86	79.41

Oxitocin (20 UI) deposited in cérvix (20 UI.), 3 hours before AI

Fertility in Merino Breed: RS vs FS

AI	n	Fert. (%)	Fec. (%)	Prol. (%)
SR	95	**40** ^{a}	51,6 ^{a}	129 ^{a}
SD	98	**17,4** ^{b}	24,5 ^{b}	141 ^{a}

P<0.001 P<0.001 P=0.63

AI in MR and SE breed ewes with refrigerated semen (RS)

Month	Breed	AI (n)	Rams (n)	Fertil (%)	Fecund (%)	Prolific (%)
June	MR	33	2	**30**	36	1,2
November	SE	58	5	**40**	86	2,1

AI and NB (natural breeding) in SE breed: reproductive parameters

Month	Method	n	Fertil (%)	Fecund (%)	Prolific (%)
Sept/October	NB	63	**57.14**	88,9	1,55
Sept/October	AI	21	**38.1**	61,9	1,62

AI in Saloia breed with RS; two period of AI (April vs September); Milk Extender; two exploitations;

Explotation	Month	AI (n)	Fertil (%)	Fecund (%)	Prolific (%)
PEP	April	181	35[a]	55[a]	1,56
PEP	September	47	47[b]	71[b]	1,5
HGV	April	58	50[b]	79[b]	1,59

AI in Saloia breed; two periods (April vs September); egg yolk extender; two exploitations

Explotation	Month	AI (n)	Fertil (%)	Fecund (%)	Prolific (%)
PEP	April	198	**28^{a}**	38^{a}	1,34
PEP	September	57	**30^{b}**	44^{a}	1,47
HGV	April	43	**47^{b}**	74^{b}	1,6

AI in Saloia Breed with RS : 2 extenders ; 2 periods of AI ; 2 exploitations

PEP/Abril	Extender	AI (n)	Fertil (%)	Fecund (%)	Prolific (%)
PEP/April	Milk	181	**35^{a}**	55^{a}	1,56^{a}
PEP/April	Egg yolk	198	**28^{a}**	38^{b}	1,34^{b}
PEP/September	Milk	47	**47^{a}**	71^{a}	1,50^{a}
PEP/September	Egg yolk	57	**30^{b}**	44^{b}	1,47^{a}
HGV/April	Milk	58	**50^{a}**	79^{a}	1,59^{a}
HGV/April	Egg yolk	43	**47^{a}**	74^{a}	1,60^{a}
		584			

Laparoscopic AI (LAI) with FS : 48 horas after sponge removal

Breed	AI (n)	PD % (45 d after LAI)
MB	20	33,3
MP	19	26,32

Bettencourt e Romão

AI in Merino ewes with RS

Breed	AI (n)	PG (%) 45 d after AI	Fertil (%)	Prolific (%)
MB	278	34.17	25.7	135
MP	315	42.2	36.7	141
	593	38.45	**32.2**	139

Romão e Bettencourt

AI in Saloia breed with RS (refrigerated) or FS (Frozen semen)

Semen	Total AI (n)	Fert. (%)	Min.	Max.
RF	420	**48.51^{a}**	28.57	63.15
FS	696	**13.04^{b}**	6.66	20.13
Total	1116			

AI with RS; Treatment effect (PgE1) on fert., fec. e prol. in Merino Breed.

Groups	AI (n)	Birth	Born	Fert. (%)	Fec. (%)	Prol. (%)
Control	20	13	18	**65^{a}**	90	138
Treated	26	12	20	46.15^{b}	76.92	167
C+T	46	25	38	**54.35**	82.61	152

AI with RS; Treatment effect (PgE1) on fert., fec. e prol. in Saloia Breed.

Groups	AI (n)	Birth	Born	Fert. (%)	Fec. (%)	Prol. (%)
Control	146	57	80	39.04	54.79	140
Treated	166	57	81	34.34	48.8	142
C+T	312	114	161	**36.54**	51.6	141

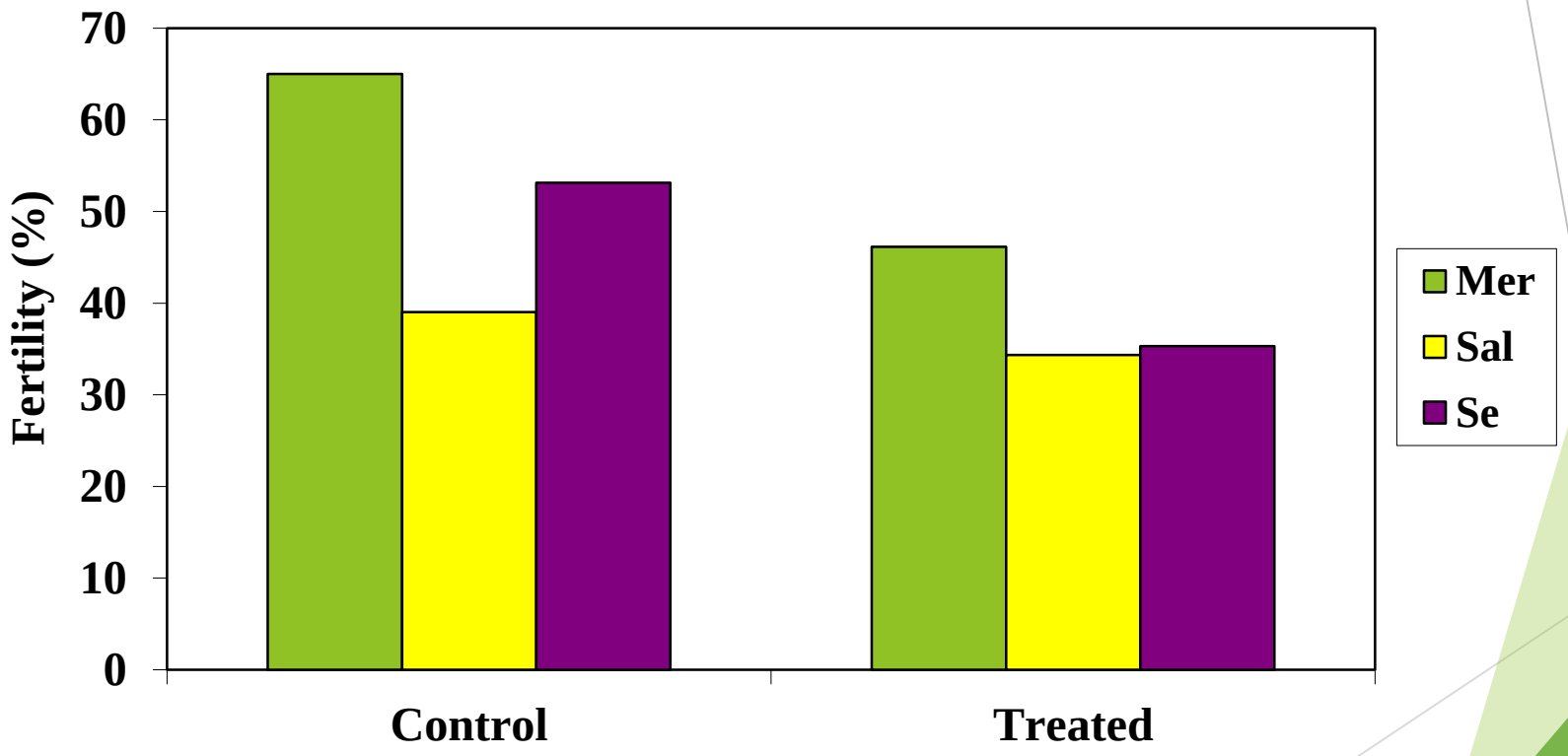
AI with RS; Treatment effect (PgE1) on fert., fec. e prol. in Serra da Estrela Breed.

Groups	AI (n)	Births (n)	Born	Fert. (%)	Fec. (%)	Prol. (%)
Control	32	17	24	53.13[a]	75	141
Treated	34	12	19	35.29[b]	58.88	158
C+T	66	19	43	**43.94**	65.15	148

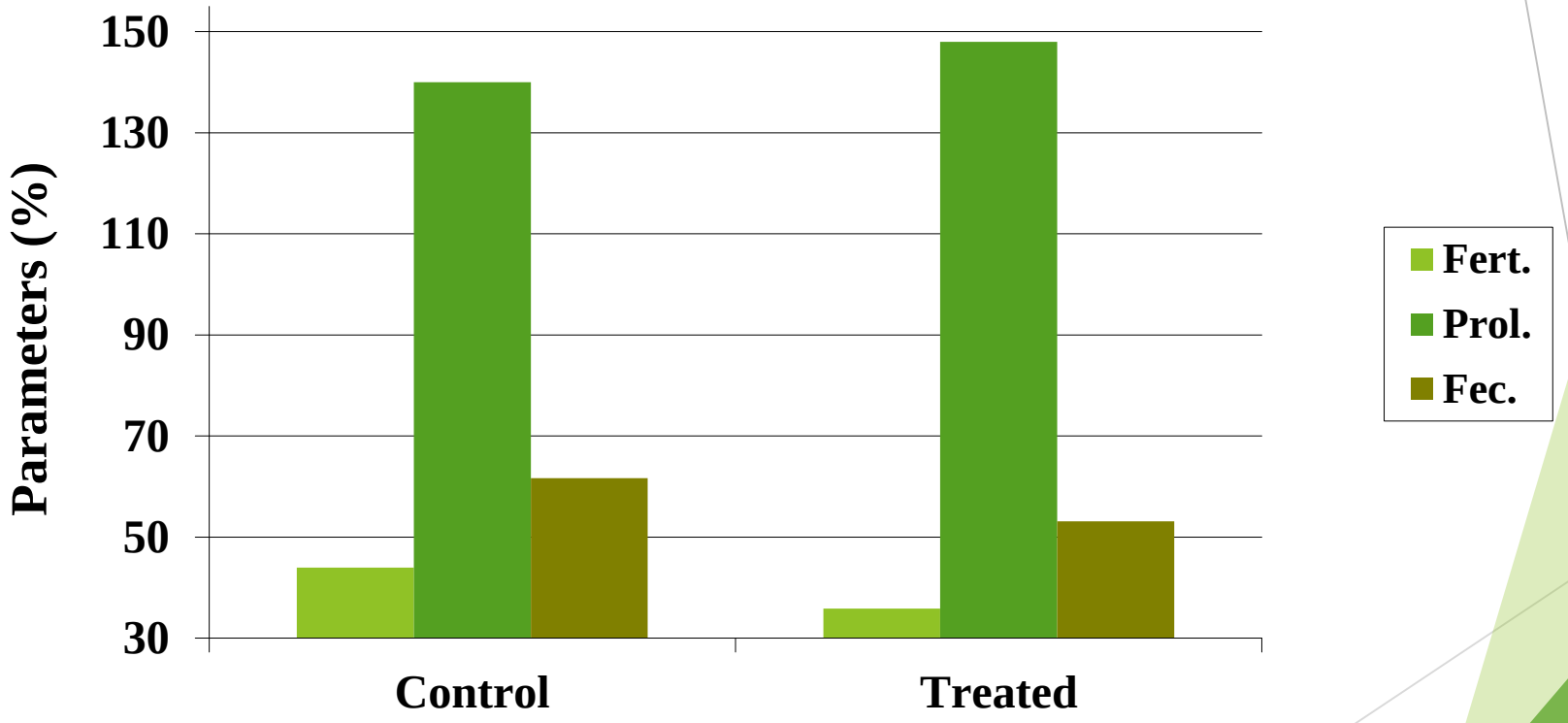
AI with RS; Treatment effect (PgE1) on fert., fec. e prol. regardless of breeds (Mer, Sal, Se).

Groups	AI (n)	Birth	Born	Fert. (%)	Fec. (%)	Prol. (%)
Control	198	87	122	43.94[a]	61.62	140
Treated	226	81	120	35.84[b]	53.1	148
C+T	424	168	242	**39.62**	57.08	144

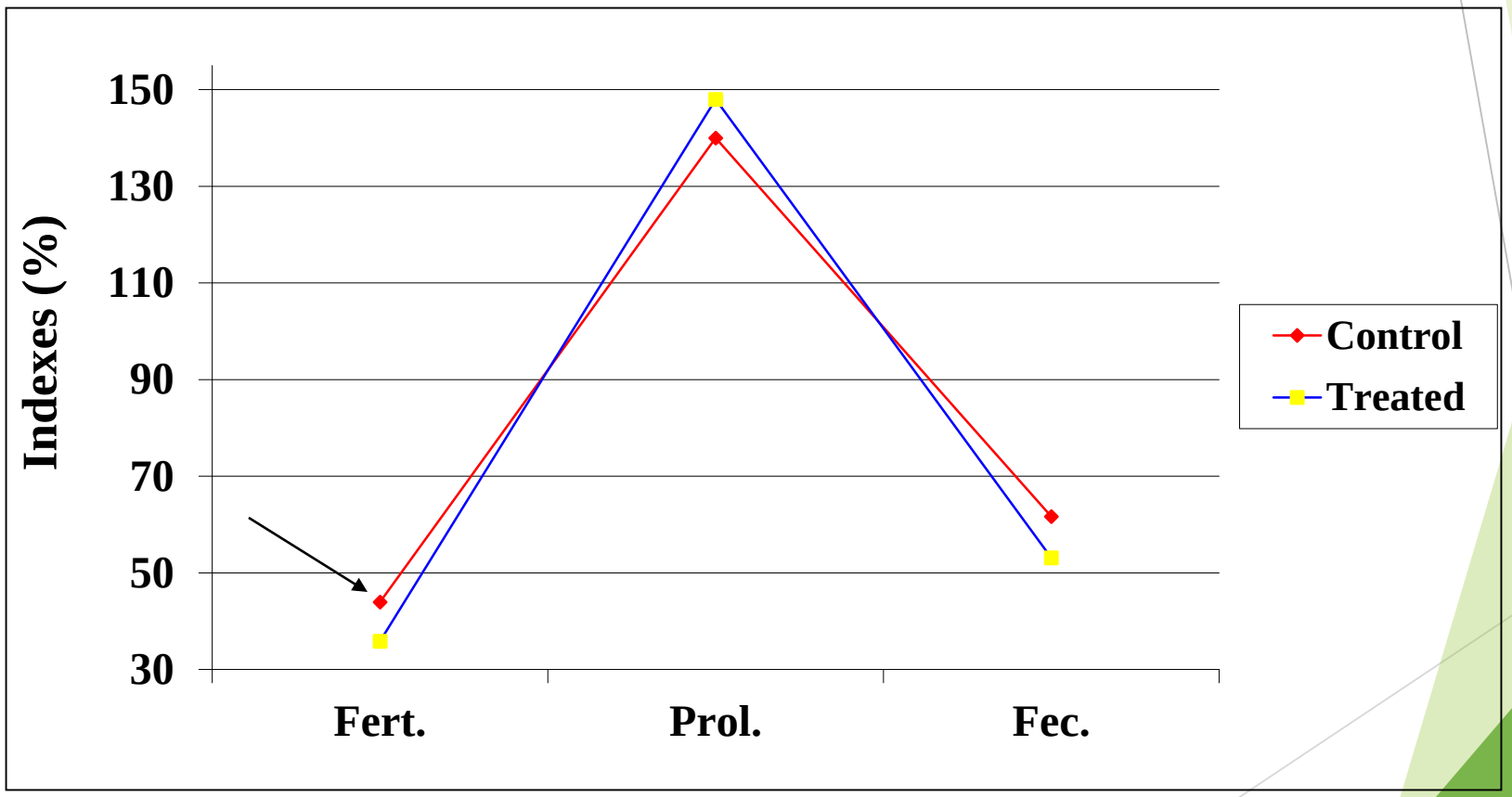
Fertility in control and treated (Misoprostol (PgE1 and terbutaline sulpahte) breeds after AI (Mer, Sal, SE))



Reproductive parameters (control and treated)



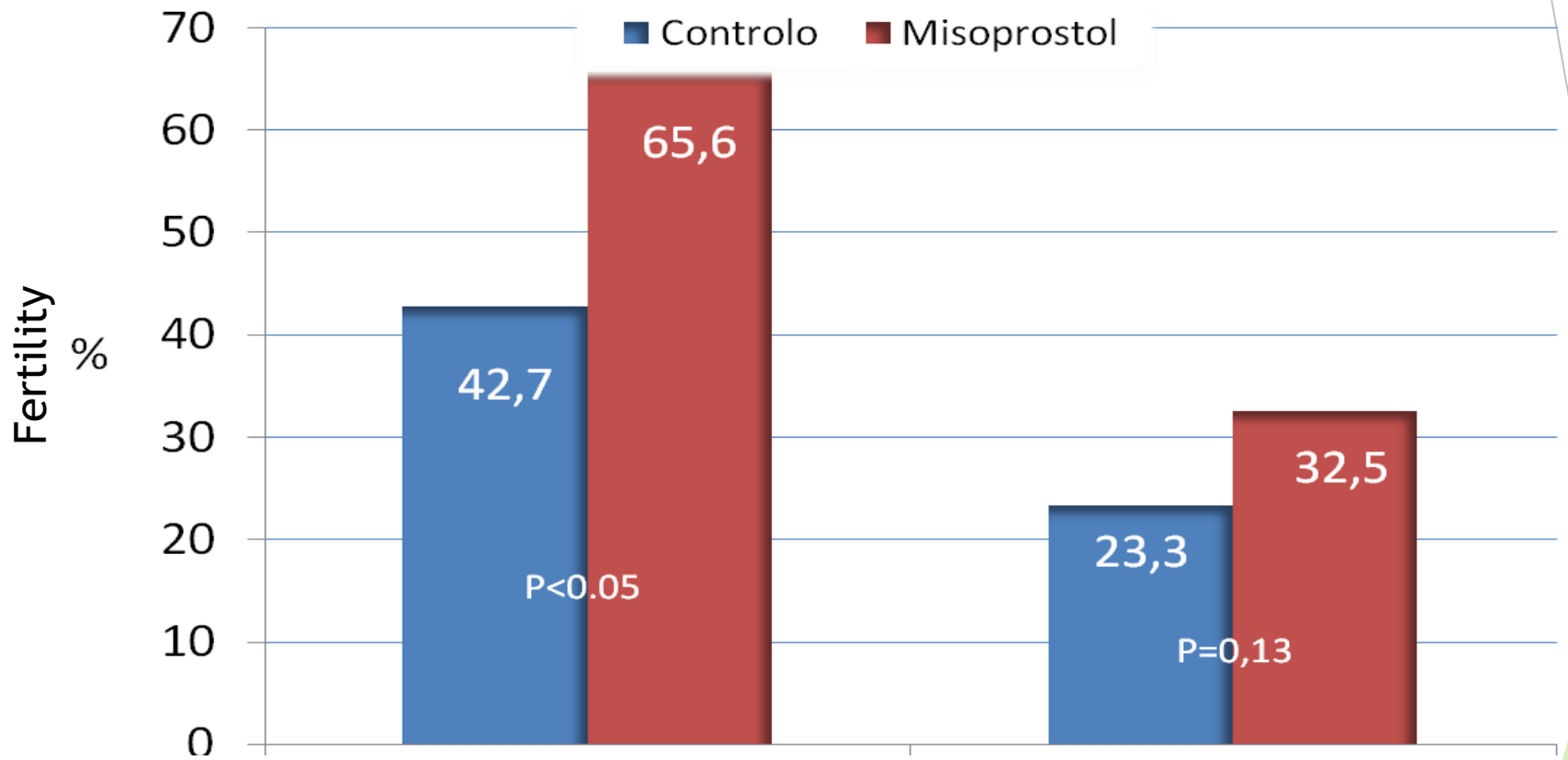
Reproductive parameters (Control and treated/PgE1)



Cervical AI with refrigerated semen (RS) or Frozen semen (FS) in Saloia breed

Semen	AI (n)	Fertility (%)	Min	Max
RS	420	**48.51[a]**	**28.57**	**63.15**
FS	696	**13.04[b]**	**6.66**	**20.13**
Total	1116			

Misoprostol (PGE1) treatment increased fertility in ewes inseminated with RS



Refrigerated Semen (RS)
n=182
Saloia + SE breeds

Frozen Semen (FS)
n=163
Saloia Breed

A Exploitation –Reproductive parameters

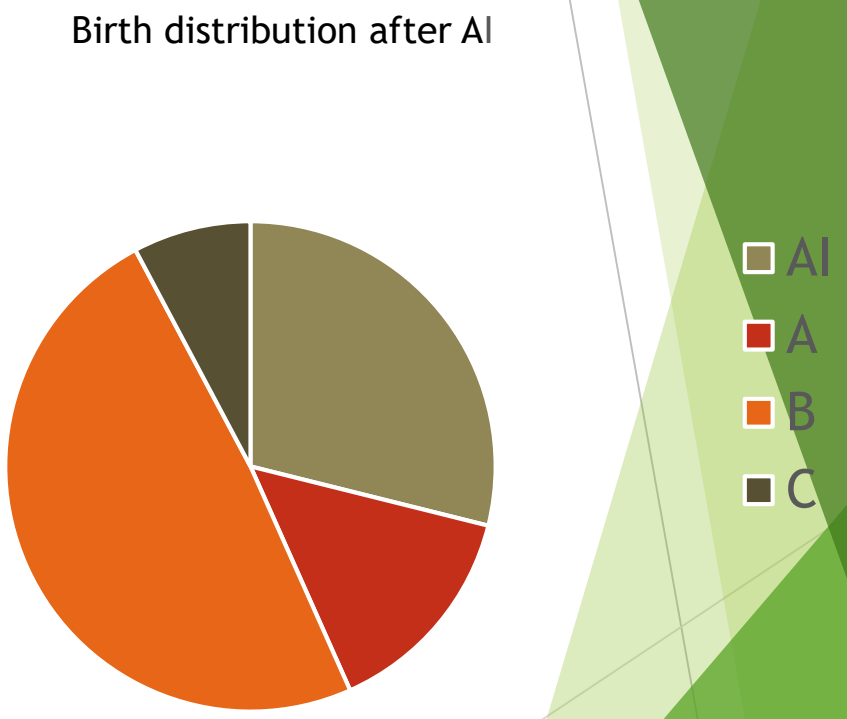
Groups	N	Births	Born	Fertil (%)	Fecund (%)	Prolific (%)
AI	90	26	32	**0.3**	0.4	1.2
NB	64	64	72	1	1.1	1.1
AI +NB	90	90	100	1.0	1.1	1.1

Exploração Birth Distribution (Days after AI)

Groups	n	Days after AI	Birth Distribution (%)	Cumulative Distribution (%)
AI	26	154	0.29	0.29
A	13	188	0.14	0.43
B	44	205	0.49	0.92
C	7	222	0.06	1

A Explotation – Birth distribution (Days after AI)

Groups	Cumulative distribution
AI	0.29
A/1 º cycle	0.14
B/2º Cycle	0.49
C/3ª Cycle	0.06



B Exploitation –Reprodutive parameters

Groups	N	Births	Born	Fertil (%)	Fecund (%)	Prolific (%)
AI	20	8	12	0.4	0.6	1.5
NB	12	12	14	1	1.2	1.2
AI+NB	20	20	26	1.0	1.3	1.3

Exploitation Birth Distribution (Days after AI)

Groups	n	Days after AI	Birth distribution (%)	Cumulative distribution
AI	20	154	0.4	0.4
NB/1º Estrous	12	170	0.6	1
AI +NB	20