



CÁMARA  
NACIONAL DE  
PRODUCTORES  
DE LECHE

# Congreso Nacional Lechero 2022

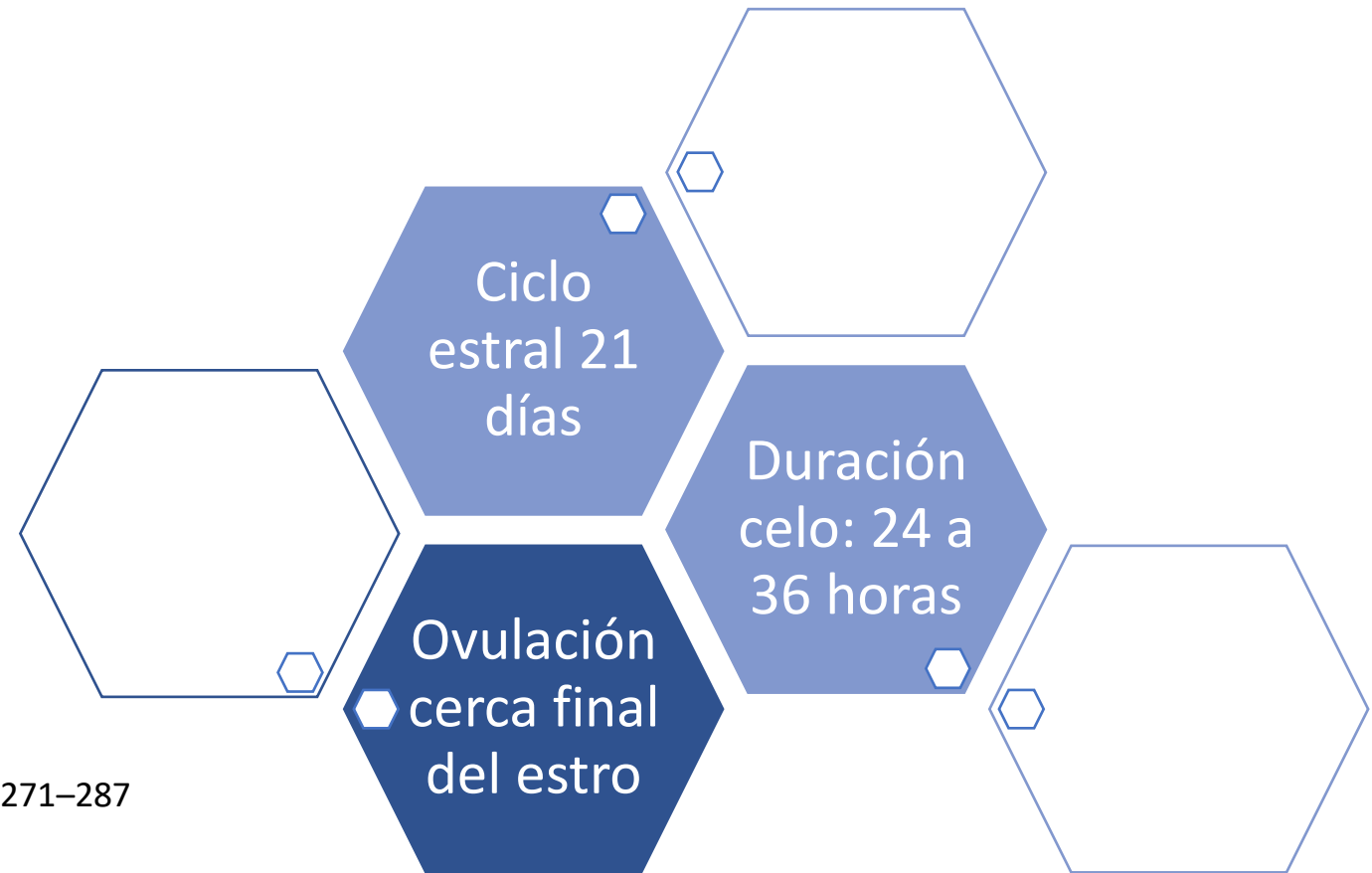
15 y 16 de Noviembre - Wyndham San José Herradura

## Inseminación artificial en cabras

MDV. Laura Chaverri Esquivel

# Fisiología reproductiva de la cabra

- (1) un patrón de ondas foliculares emergiendo cada 5 a 7 días.
- (2) la existencia de dominancia folicular.
- (3) el papel de progesterona que controla el recambio folicular y la duración de la fase lútea.



E. Rubianes, A. Menchaca / Animal Reproduction Science 78 (2003) 271–287



# Revisión de celos

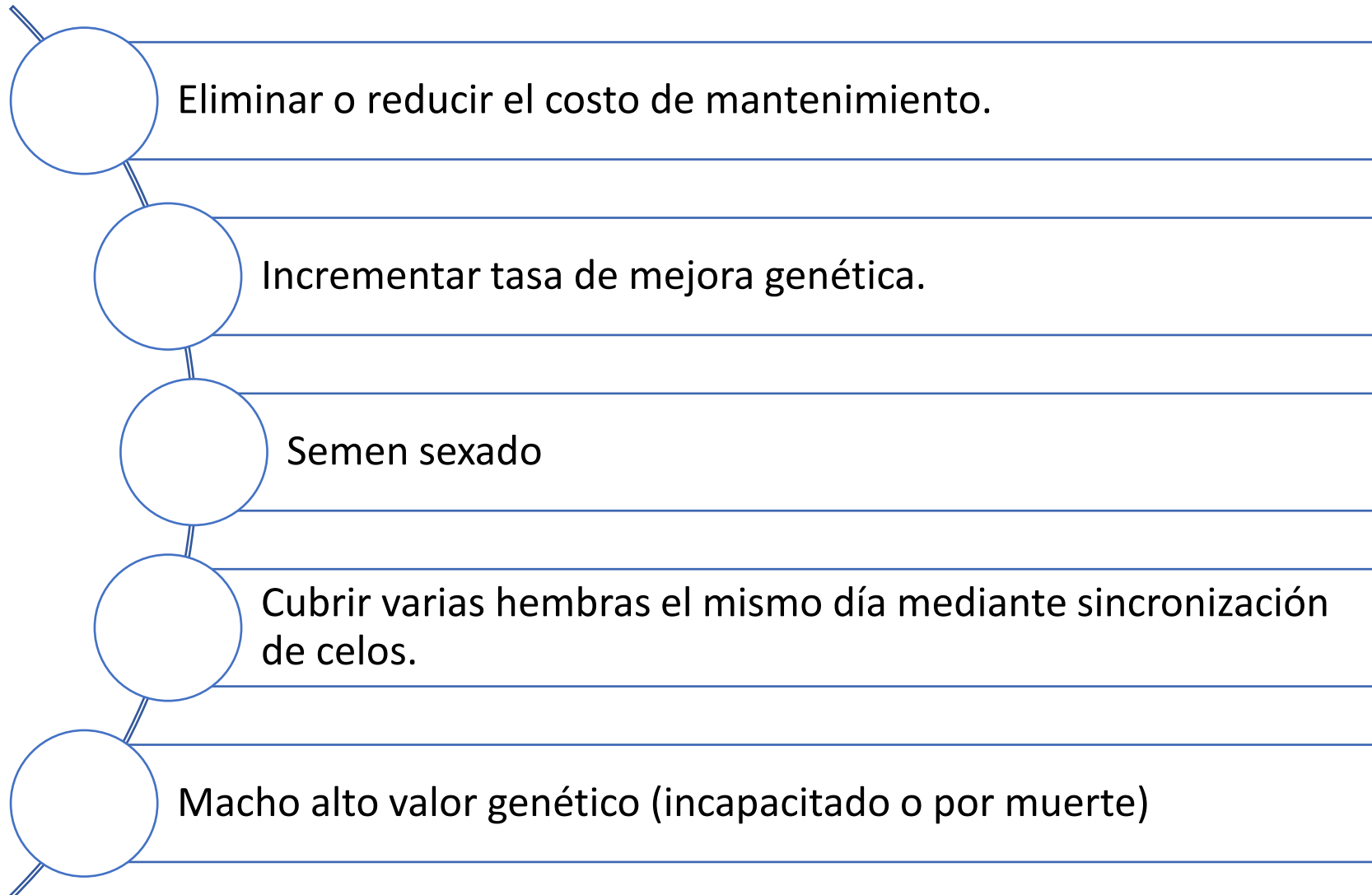
Descarga cervical:

Claro y delgado: celo temprano

Turbio: terminando celo

Observación celo: 2  
veces/día 15 -20 min  
(muy am y pm)

# Ventajas de la inseminación artificial



---

## Precauciones

Evaluar el semen

---

Equipo limpio, libre agua

---

No usar lubricantes (agua)

---

ID adecuada de cada pajilla

---

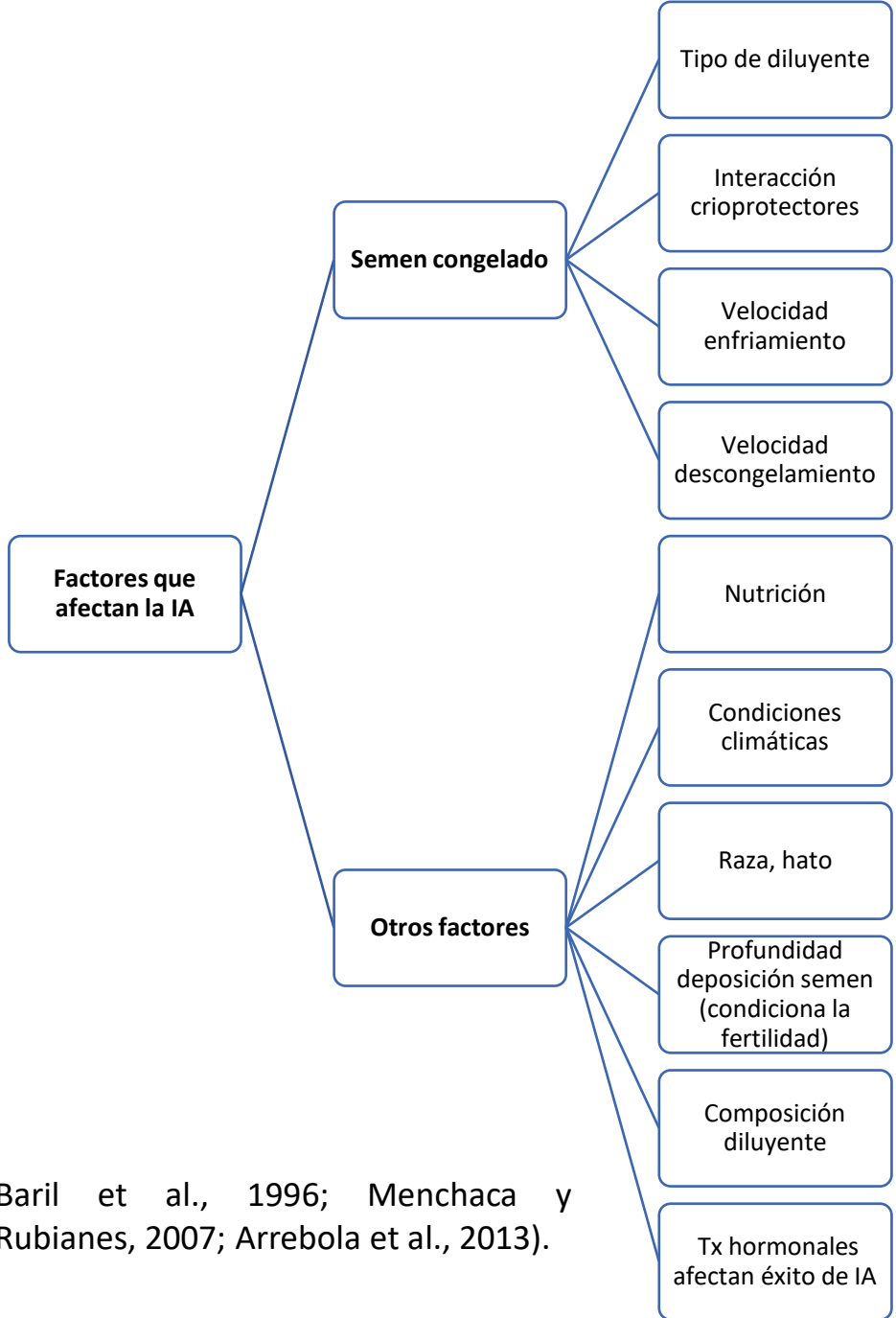
Evitar cambios bruscos de temperatura y corrientes de aire al descongelar

---

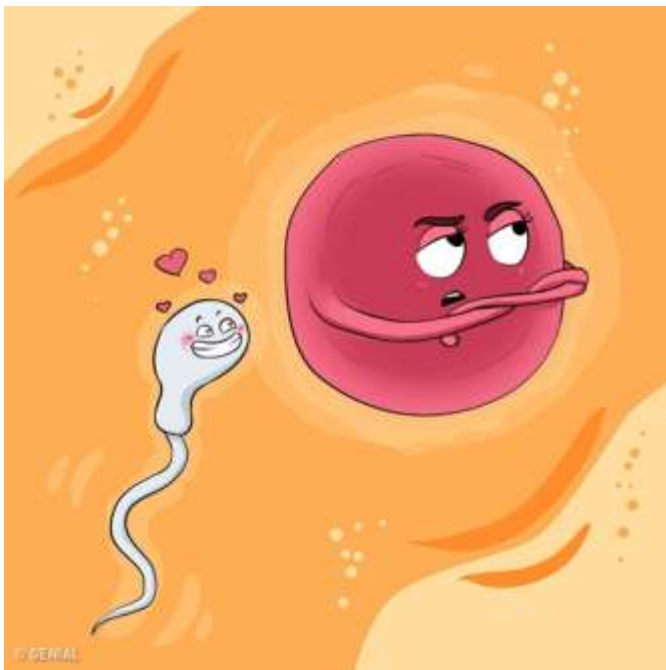
# Selección de hembras

- No primeriza, + 75% PV
- Ciclicidad cada 21 días
- CC: 2.5 a 3.5
- Manejo sanitario
- Buena madre
- Manejo rutina, nutrición

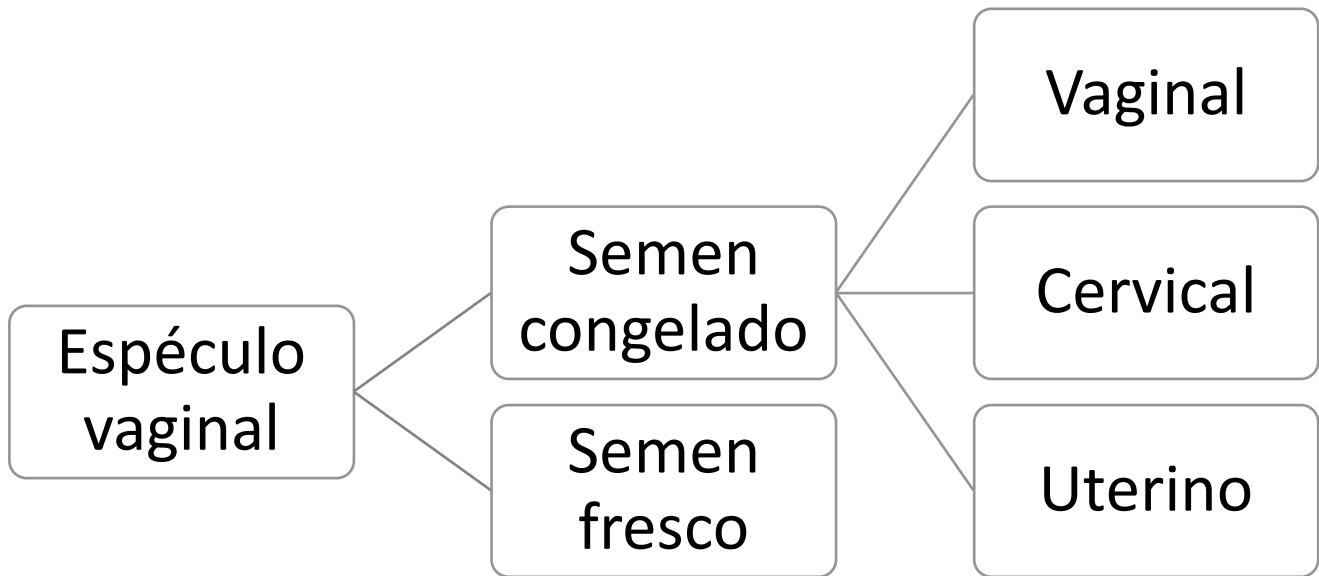




La recomendación estándar IA dos (o tres) veces a intervalos de 12 horas.



Baril et al., 1996; Menchaca y Rubianes, 2007; Arrebola et al., 2013).





# Eficiencia reproductiva en cabras lecheras

SEMEN	VIA	DOSIS	IA	PREÑEZ
FRESCO	Cervical	100 mill	Con detección de celo	60-70%
CONGELADO	Cervical	200 mill	Con detección de celo Sistemática*	50% (±10%)
	Laparosc.	50 mill	Con detección de celo Sistemática**	55% (±10%)

\* 45 horas post retiro de las esponjas intravaginales

\*\* 55 horas post retiro de las esponjas intravaginales

Alejandro Gibbons, 2014.

Semen fresco: 3000 millones/cc de semen; 30 hembras. Sin diluir 0.03 cc por cabra.

# Tipos de inseminación artificial

Ideal pasar el  
cérvix para  
obtener más  
70%

Vaginal

Intracervical

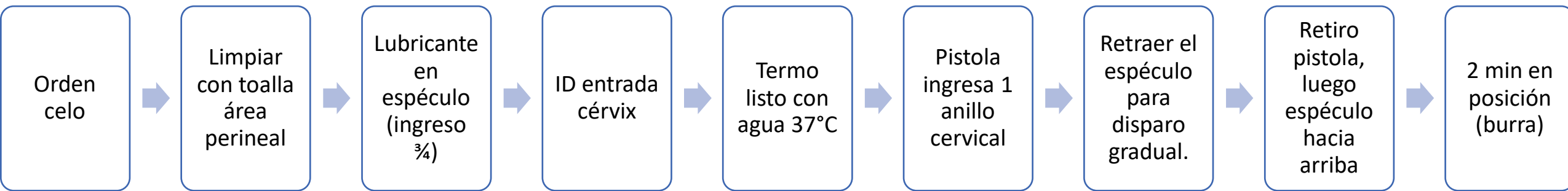
Intrauterina transcervical

Intrauterina laparoscópica

# Equipo para inseminación artificial



# Pasos de la IA



-196°C Nitrógeno líquido  
Regla negra 10 a 15 segundos



# Inseminación con retracción del cérvix

---

# Materiales IA retracción cervical



# Inseminación transcervical



# Inseminación transcervical





# Inseminación recto vaginal











Small Ruminant Research

Volume 215, October 2022, 106780



## Recto-vaginal artificial insemination using digital rectal palpation technique in Red Sokoto goat

Adeh A. Bello <sup>a</sup>  , Ambrose A. Voh Jr <sup>b</sup>  , David Ogwu <sup>a</sup>  , Joseph O. Ayo <sup>c</sup>  

Show more 

+ Add to Mendeley  Share  Cite

<https://doi.org/10.1016/j.smallrumres.2022.106780>

[Get rights and content](#)

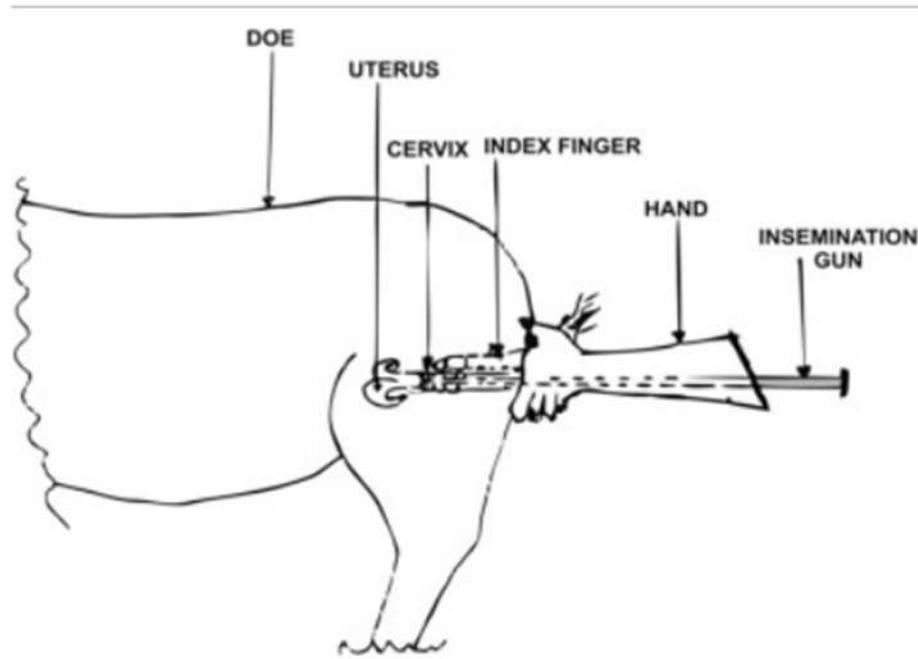
### Abstract

Artificial insemination was carried out to evaluate the effectiveness of digital rectal palpation as a new technique of artificial insemination (AI) in Red Sokoto goat. Forty two Red Sokoto goat does were randomly divided into group A (Recto-vaginal DRPAI; n = 14), group B (Vaginal speculum AI; n = 14) and group C (Natural service; n = 14). Semen was collected from two Red Sokoto breeding bucks using artificial vagina, processed and stored at 4°C. Oestrus was synchronised with prostaglandin F2-alpha, and oestrus detected by apronised bucks and visual observation. Breeding was by artificial insemination for groups A and B while group C bred by natural service. Pregnancy diagnosis was carried out using ultrasonography on day 126. Conception rates were 61.5%, 58.3% and 100%, while pregnancy rates were 57.1%, 50.0% and 100% for groups A, B and C, respectively. There was no significant difference ( $P > 0.05$ ) between groups A and B. It was concluded that digital rectal palpation technique effectively carried out recto-vaginal artificial insemination with similar and acceptable conception (61.5%) and pregnancy (57.1%) rates to vaginal speculum artificial insemination but lower to natural service in Red Sokoto goat does. However, it is recommended that further studies be carried out with more animal number to verify findings.

**Congreso Nacional Lechero 2022**



# Inseminación recto vaginal



[Download : Download high-res image \(71KB\)](#)

[Download : Download full-size image](#)

Adeh A. Bello, Ambrose A. Voh, David Ogwu, Joseph O. Ayo, Recto-vaginal artificial insemination using digital rectal palpation technique in Red Sokoto goat, Small Ruminant Research, Volume 215, 2022, 106780, ISSN 0921-4488, <https://doi.org/10.1016/j.smallrumres.2022.106780>.

Fig. 1. Schematic illustration of recto-vaginal artificial insemination using Digital Rectal Palpation technique in a Red Sokoto goat doe - Cervix located and used as site for semen deposition.

Table 2. Fertility of Red Sokoto goat does following breeding by recto-vaginal digital rectal palpation (DRP) technique artificial insemination, vaginal speculum artificial insemination and natural service for groups A, B and C.

S/N	Fertility indices	Fertility rates		
		Group A (n = 14)	Group B (n = 14)	Group C (n = 14)
1.	Oestrus response	92.9% <sup>a</sup>	85.7% <sup>a</sup>	100% <sup>a</sup>
2.	Conception rate	61.5% <sup>a</sup>	58.3% <sup>a</sup>	100% <sup>b</sup>
3.	Pregnancy rate	57.1% <sup>a</sup>	50.0% <sup>a</sup>	100% <sup>b</sup>

a

Letter superscription indicate significant ( $P < 0.05$ ) difference. There was no significant difference ( $P > 0.05$ ) between groups A and B for conception and pregnancy rates; but there was significant difference ( $P < 0.05$ ) between groups A and B with group C for conception and pregnancy rates.

b

Letter superscription indicate significant ( $P < 0.05$ ) difference. There was no significant difference ( $P > 0.05$ ) between groups A and B for conception and pregnancy rates; but there was significant difference ( $P < 0.05$ ) between groups A and B with group C for conception and pregnancy rates.

Adeh A. Bello, Ambrose A. Voh, David Ogwu, Joseph O. Ayo, Recto-vaginal artificial insemination using digital rectal palpation technique in Red Sokoto goat, Small Ruminant Research, Volume 215, 2022, 106780, ISSN 0921-4488, <https://doi.org/10.1016/j.smallrumres.2022.106780>.

# Inseminación recto vaginal



Table 1

Reproduction parameters of naturally and artificially (AI) inseminated Alpine goats.

Parameters	Natural breeding	AI	<i>P</i>
Pregnancy rate (pregnant/synchronised goats) (%)	93 <sup>a</sup> (28/30)	70 <sup>b</sup> ( 21 /30 )	0.041
Litter size (no. of kids)	51	45	-
Twinning rate	1.82 ± 0.47 <sup>a</sup>	2.14 ± 0.24 <sup>b</sup>	0.040
Mortality rate (weaned/born kids) (%)	2 <sup>a</sup> (1/51)	4 <sup>b</sup> (2/45)	0.034
Litter weight at birth (kg)	3.83 ± 0.23	3.15 ± 0.11	0.230
Litter weight at weaning (kg)	12.44 ± 1.25 <sup>a</sup>	11.16 ± 1.39 <sup>b</sup>	0.039

[Open in a separate window](#)

Agossou DJ, Koluman N. The effects of natural mating and artificial insemination using cryopreserved buck semen on reproductive performance in Alpine goats. Arch Anim Breed. 2018 Dec 5;61(4):459-461. doi: 10.5194/aab-61-459-2018. PMID: 32175453; PMCID: PMC7065385.

# Resultados de inseminación artificial a tiempo fijo



Table 1

Pregnancy rate (%) obtained after short progestogen priming (5–6 days) and natural breeding or artificial insemination with fresh semen at different times after oestrous detection (AI) or at fixed time (TAI) in dairy goats<sup>a</sup>

	Natural breeding	AI			TAI	
		12 h	24 h	12 and 24 h	48 h	54 h
%PR (n)	80.0 (40)	75.5 (49)	70.8 (24)	63.6 (55)	45.0 (131)	68.3 (142)

<sup>a</sup> Pooled data from [Rubianes et al. \(2001\)](#).

E. Rubianes, A. Menchaca / *Animal Reproduction Science* 78 (2003) 271–287



Contents lists available at [ScienceDirect](#)

Theriogenology

journal homepage: [www.theriojournal.com](http://www.theriojournal.com)



## Use of injectable progesterone and hCG for fixed-time artificial insemination during the non-breeding season in goats

Alan Sebastian Alvarado-Espino <sup>a</sup>, Alejo Menchaca <sup>b</sup>, Cesar Alberto Meza-Herrera <sup>c</sup>, Miguel Mellado <sup>d</sup>, Fernando Arellano <sup>a</sup>, Francisco Véliz <sup>a,\*</sup>

<sup>a</sup> Universidad Autónoma Agraria Antonio Narro, Periférico Raúl López Sánchez y Carretera a Santa Fe, Torreón, Coahuila, 27054, México

<sup>b</sup> Instituto de Reproducción Animal Uruguay, Fundación IRAUy, Cno. Cruz del Sur 2250, 12200, Montevideo, Uruguay

<sup>c</sup> Universidad Autónoma Chapingo, Unidad Regional Universitaria de Zonas Áridas, Bermejillo, Durango, 35230, México

<sup>d</sup> Universidad Autónoma Agraria Antonio Narro, Departamento de Nutrición Animal, Saltillo, Coahuila, México

## ABSTRACT

The objective of this study was to determine the estrous response and the moment of ovulation and fertility after a progesterone (P4) priming plus human chorionic gonadotropin (hCG) administration in multiparous and nulliparous goats. Therefore, two experiments were conducted during non-breeding season (April and May, 26° N) and all the animals received a single injection of 20 mg of P4 and 100 IU of hCG 24 h later. In Experiment 1, 13 multiparous and 9 nulliparous goats were subjected to estrus detection twice a day from P4 administration, and their ovaries were scanned by transrectal ultrasonography every 12 h from the onset of estrus to determine ovulation. The proportion of goats in estrus did not differ between multiparous and nulliparous females. The onset of estrus ( $60.5 \pm 12.4$  h vs.  $52.0 \pm 5.2$  h after hCG administration) and the moment of ovulation ( $91.5 \pm 10.3$  h vs.  $85.3 \pm 11.5$  h) were also similar in multiparous and nulliparous goats. In Experiment 2, a total of 299 multiparous and nulliparous goats managed under intensive ( $n = 112$  and 41 goats, respectively) or extensive ( $n = 85$  and 61 goats, respectively) production systems were divided to receive a fixed-time artificial insemination (FTAI) with fresh semen at 60 or 72 h after hCG administration. The pregnancy rate did not differ significantly between multiparous and nulliparous goats in both production systems. Nonetheless, in the intensive system pregnancy rate was affected by the moment of insemination ( $P < 0.05$ ). In this system, the pregnancy rate was higher in goats inseminated at 60 h than in 72 h (55.6%, 44/79 vs. 35.1%, 26/74, respectively;  $P < 0.05$ ). On the contrary, in the extensive system the pregnancy rate was not affected by the time of insemination (29.4%, 23/78 vs. 22.0%, 15/68). To conclude, both the ovulatory response and the pregnancy rate after a single P4 injection plus hCG was similar between multiparous and nulliparous goats during anovulatory season. Although the pregnancy rate was not affected by the time of insemination in the extensive production system, under intensive conditions FTAI should be performed at 60 h after hCG treatment.

© 2018 Elsevier Inc. All rights reserved.

<https://doi.org/10.1016/j.theriogenology.2018.12.035>

Congreso Nacional Lechero 2022





**Table 2**

Pregnancy rate and number of fetuses obtained in multiparous and nulliparous goats synchronized with a single injection of 20 mg of progesterone plus 100 IU of human chorionic gonadotropin (hCG) and subjected to fixed-time artificial insemination (FTAI) during non-breeding season.

	Pregnant/treated goats	No. fetuses/pregnant goats
<b>Intensive production system</b>		
<b>Parity</b>		
Multiparous	42.8% (48/112) <sup>a</sup>	1.7 ± 0.5 <sup>a</sup>
Nulliparous	53.6% (22/41) <sup>a</sup>	1.6 ± 0.5 <sup>a</sup>
<b>Moment of FTAI</b>		
60 h	55.6% (44/79) <sup>a</sup>	1.6 ± 0.5 <sup>a</sup>
72 h	35.1% (26/74) <sup>b</sup>	1.7 ± 0.5 <sup>a</sup>
Interaction parity*FTAI	P= NS	P= NS
<b>Extensive production system</b>		
<b>Parity</b>		
Multiparous	29.4% (25/85) <sup>a</sup>	1.7 ± 0.5 <sup>a</sup>
Nulliparous	21.3% (13/61) <sup>a</sup>	1.5 ± 0.5 <sup>b</sup>
<b>Moment of FTAI</b>		
60 h	29.4% (23/78) <sup>a</sup>	1.7 ± 0.4 <sup>a</sup>
72 h	22.0% (15/68) <sup>a</sup>	1.7 ± 0.5 <sup>a</sup>
Interaction parity*FTAI	P= NS	P= NS

For each production system, different superscripts between rows differ significantly ( $P \leq 0.05$ ).

<https://doi.org/10.1016/j.theriogenology.2018.12.035>

**Sistema intensivo:** tasa de preñez fue mayor en las cabras inseminadas a las 60h que a las 72h (55,6%, 44/79 vs. 35,1%, 26/74, respectivamente;  $P < 0,05$ ).

**Sistema extensivo:** la tasa de preñez no se vio afectada por el momento de la inseminación (29,4%, 23/78 vs. 22,0%, 15/68).

La respuesta ovulatoria como la tasa de preñez después de una sola inyección de P4 + hCG fueron similares entre cabras multíparas y nulíparas durante la temporada anovulatoria.

La tasa de preñez no se vio afectada por el momento de la inseminación en el sistema de producción extensivo, en condiciones intensivas, la IATF debe realizarse a las 60 h después del tratamiento con hCG.

Muchas gracias por su atención!!



**Congreso Nacional Lechero 2022**

