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EDUCATION

Ph.D. in Animal Breeding and Reproduction at OSU, 1994
Master of Science degree in Animal Science at OSU, 1991
Bachelor of Science Montevideo, Uruguay 1981

PUBLICATIONS

1. Vizcarra, J.A., J.M. Mieres, and D. Vaz Martins. 1985. The effect of different growth parameters and some characteristics of the carcass, on the composition, dressing percentage and weight of valuable retail cuts of Hereford steers (I). (Efecto de distintos parámetros de crecimiento y características de la res en la composición, rendimiento y peso de cortes valiosos del cuarto trasero de novillos Hereford I). Investigaciones Agronómicas 6:60.
2. Vizcarra, J.A., W. Ibañez and R. Orcasberro. 1986. Repeatability and reproducibility of two systems to evaluate body condition in Hereford beef cows. (Repetibilidad y reproductibilidad de dos escalas para estimar la condición corporal de vacas Hereford). Investigaciones Agronómicas. 7:45.
3. Vizcarra, J.A., J.M. Mieres and D. Vaz Martins. 1986. The effect of different growth parameters and some characteristics of the carcass, on the composition, dressing percentage and weight of valuable retail cuts of Hereford steers (II). (Efecto de distintos parámetros de crecimiento y características de la res en la composición, rendimiento y peso de cortes valiosos del cuarto trasero de novillos Hereford II). Investigaciones Agronómicas 7: 37.
4. Vizcarra, J.A., R.P. Wettemann and D.K. Bishop. 1995. Relationship between the occurrence of puberty in heifers and the cessation of luteal activity after nutritional restriction. Anim. Sci. 61:507.
5. Vizcarra, J.A. and R.P. Wettemann. 1996. Reproducibility, repeatability and degree of expertise required to asses body condition score in beef cattle. The Professional Animal Scientist 12:28-31.
[Abstract]
6. Vizcarra, J.A., R.P. Wettemann, T. Braden, A.M. Turzillo and T. Nett. 1997. The effect of GnRH pulse frequency on serum and pituitary concentrations of LH and FSH, GnRH receptors, and messenger RNA for gonadotropin subunits in cows. Endocrinology 138:594-601.
[Abstract]
[Full Text]
7. Vizcarra, J.A., R.P. Wettemann, J.C. Spitzer, and D.G. Morrison. 1998. Body condition at parturition and postpartum weight gain influence luteal activity, glucose, insulin and NEFA concentrations in primiparus beef cows. J. Anim. Sci. 76:927-936.

[Abstract]
[Full Text]

8. Bossis, I., R.P. Wettemann, S.D. Welty, J.A. Vizcarra, L.J. Spicer, and M.G. Diskin. 1999. Nutritionally induced anovulation in beef heifers: ovarian and endocrine function preceding cessation of ovulation. *J. Anim. Sci.* 77:1536-1546.

[Abstract]
[Full Text]

9. Vizcarra, J.A., R.P. Wettemann and G.L. Morgan. 1999. Influence of amplitude, frequency and duration of infused GnRH pulses on secretion of LH and FSH in nutritionally anestrous beef cows. *Domestic Animal Endocrinology* 16(3):171-181.

[Abstract]

10. Hamilton, T.D., J.A. Vizcarra, R.P. Wettemann, B.E. Keefer and L.J. Spicer. 1999. Ovarian function in nutritionally induced anoestrous cows: effect of exogenous gonadotropin-releasing hormone in vivo and effect of insulin and insulin-like growth factor I in vitro. *J. Reprod. Fertil.* 117:179-187.

[Abstract]

11. Bossis, I., R.P. Wettemann, S.D. Welty, J.A. Vizcarra, and L.J. Spicer. 2000. Nutritionally induced anovulation in beef heifers: ovarian and endocrine function during realimentation and resumption of ovulation. *Biol. Reprod.* 62:1436-1444.

[Abstract]
[Full Text]

12. Arelovich, H.M., F.N. Owens, G. W. Horn, and J.A. Vizcarra. 2000. Effects of zinc and manganese on ruminal fermentation, diet intake and digestibility in cattle fed prairie hay and urea. *J. Anim. Sci.* 78:2972-2979.

[Abstract]
[Full Text]

13. Looper, M.L., Vizcarra, J.A., and R.P. Wettemann. 2000. Estrus and Luteal Activity of Postpartum Beef Cows after Treatment with Gonadotropin-Releasing Hormone and Prostaglandin F2a. *The Professional Animal Scientist* 16(4): 207-212.

[Abstract]

14. Bacon, W.L., J.A. Vizcarra, J.L.M. Morgan, J. Yang, H.-K. Liu, D.W. Long, and J.D. Kirby. 2001. Changes in Plasma Concentrations of Luteinizing Hormone, Progesterone, and Estradiol-17b in Peripubertal Turkey Hens Under Constant Lighting or 14L:10D Photoperiods. *Endocrinology* (submitted)

MISCELLANEOUS PUBLICATIONS

1. Vizcarra, J.A., R.P. Wettemann, D.K. Bishop and R.E. Wright. 1991. Relationship between the occurrence of puberty in heifers and the cessation of luteal activity after nutritional restriction. *Okla. Agr. Exp. Sta. Res. Rep.* MP-134:44.

2. Vizcarra, J.A. 1991. Factors influencing reproduction of beef heifers: age at puberty, nutritional anestrus, glucose in plasma and consumption of cobalt. Master of Science Thesis. Oklahoma State University, Stillwater pp 78.

3. Vizcarra, J.A., R.P. Wettemann, D.K. Bishop, S. Al-Shorepy, M. Aslam, L.A. Baker, B. De Rohdas and D.L. Wall. 1991. Effects of elevated ambient temperature on sweating rate, rectal temperature and respiration rate of heifers. *Okla. Agr. Exp. Sta. Res. Rep.* MP-134:40.

4. Bishop, D.K., R.P. Wettemann and J.A. Vizcarra. 1992. Blood metabolites in steers fed protein supplement daily or at 4 day intervals. *Okla. Agr. Exp. Sta.*

Res. Rep. MP-136:245.

5. Vizcarra, J.A., R.P. Wettemann, D.K. Bishop and M.P. Payton. 1993. Methods to determine the frequency of LH pulses. Fourth annual graduate student research symposium Oklahoma State University p 81.

6. Vizcarra, J.A. and R.P. Wettemann. 1993. Relationship between body weight changes in postpuberal heifers and cessation of luteal activity. Okla. Agr. Exp. Sta. Res. Rep. P-933:351.

7. Wettemann, R.P., H.A. Tucker, K.S. Lusby, D.K. Bishop, J.V. Yelich and J.A. Vizcarra. 1994. Treatment with melatonin increases pregnancy rate of beef cattle. Okla. Agr. Exp. Sta. Res. Rep. P-939:204.

8. Vizcarra, J.A., R.P. Wettemann and D.K. Bishop. 1994. Effect of immunization of beef cattle against GnRH. Fifth annual graduate student research symposium Oklahoma State University p 113.

9. Vizcarra, J.A. 1994. Regulation of pulsatile secretion of gonadotropin releasing hormone (GnRH) in nutritionally anestrus beef cows. Ph.D. Dissertation, Oklahoma State University, Stillwater pp. 167.

10. Vizcarra, J.A. and R.P. Wettemann. 1994. Immunization of beef heifers against gonadotropin releasing hormone: effectiveness of the protein that is conjugated to GnRH. Okla. Agr. Exp. Sta. Res. Rep. P-939:213.

11. Vizcarra, J.A., R.P. Wettemann, K.S. Lusby G.E. Selk and J.V. Yelich. 1995. Body condition score is a precise tool to evaluate beef cows. Okla. Agr. Exp. Sta. Res. Rep. P-943:201.
[Full text]

12. Wettemann, R.P., J. Vizcarra, T. Anderson, S. Brown, C. Burtrum, J. Hallock, E. Nesamvuni, T. Prado and M. Sumter. 1995. Influence of feed and water deprivation on the determination of body weight in mature beef cows. Okla. Agr. Exp. Sta. Res. Rep. P-943:211.
[Full text]

13. Vizcarra, J.A. and R.P. Wettemann. 1995. Immunization of beef heifers against GnRH prevents pregnancy. Okla. Agr. Exp. Sta. Res. Rep. P-943:206.
[Full text]

14. Bossis, I., S.D. Welty, R.P. Wettemann, J.A. Vizcarra and L.J. Spicer. 1996. Ovarian and endocrine changes before the onset of nutritionally induced anovulation in beef heifers. Okla. Agr. Exp. Sta. Res. Rep. P-951:309.
[Full text]

15. Looper, M.L., J.A. Vizcarra and R.P. Wettemann. 1996. Response of postpartum beef cows to treatment with gonadotropin-releasing hormone and prostaglandin F2alpha. Okla. Agr. Exp. Sta. Res. Rep. P-951:317.
[Full text]

16. Looper, M.L., J.A. Vizcarra and R.P. Wettemann. 1996. Influence of nutrition on luteinizing hormone and follicle stimulating hormone in beef cows. Okla. Agr. Exp. Sta. Res. Rep. P-951:291.
[Full text]

17. Lents, C.A., R.P. Wettemann, J.A. Vizcarra and M.J. Paape. 1996. Administration of antibiotics to beef cows: effects on mastitis and calf growth. Okla. Agr. Exp. Sta. Res. Rep. P-951:81.
[Full text]

18. Lents, C.A., R.P. Wettemann, H.T. Purvis II and J.A. Vizcarra. 1996. Influence of feed and water deprivation, calf sex, and early weaning on blood

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components and estradiol concentrations in beef calves. Okla. Agr. Exp. Sta. Res. Rep. P-951:285.
[Full text]

19. Looper, M.L., C.A. Lents, J.A. Vizcarra and R.P. Wettemann. 1997. Effects of body condition on luteal activity and estrus in postpartum beef cows. Okla. Agr. Exp. Sta. Res. Rep. pp 159-162.
[Full text]

20. Lents, C.A., R.P. Wettemann, J.A. Vizcarra, M.L. Looper and M.J. Paape. 1997. Dry cow treatment of beef cows. Okla. Agr. Exp. Sta. Res. Rep. pp 45-49.
[Full text]

21. Arelovich, H.M., F.N. Owens, G.W. Horn and J.A. Vizcarra. 1997. Effects of supplemental zinc and manganese on in vitro urea degradation and prairie hay disappearance. Okla. Agr. Exp. Sta. Res. Rep. pp 103-108.
[Full text]

22. Vizcarra, J.A. 1998. International markets hold potential for U.S. meats. In: Special Report. Feedstuffs 70(3): 1-47.
[Full text]

23. Arelovich, H.M., F.N. Owens, G.W. Horn and J.A. Vizcarra. 1998. Urea Utilization by Cattle Fed Prairie Hay and Supplemented with Zinc. Okla. Agr. Exp. Sta. Res. Rep. pp 103-108.
[Full text]

24. Lents, C.A., R.P. Wettemann, M.L. Looper, I. Bossis, L.J. Spicer, and J.A. Vizcarra. 1998. Concentrations of GH, IGF-I, Insulin, and Glucose in Postnatal Beef Calves. Okla. Agr. Exp. Sta. Res. Rep. pp 215-222. Okla. Agr. Exp. Sta. Res. Rep. pp 103-108.
[Full text]

25. Kirby, J.D., C.J. Tressler, and J. A. Vizcarra. 2000. Effects of modern breeding practices on semen quality. World's Poultry Science Association Lecture S3.2.03.

ABSTRACT

1. Vizcarra, J.A., R.P. Wettemann, D.K. Bishop and R. Wright. 1991. Relationship between the occurrence of puberty and the cessation of luteal activity after nutritional restriction. J. Anim. Sci. (Suppl. 1) 69:41.

2. Ormazabal, J.J., R.P. Wettemann, J.A. Vizcarra and D.K. Bishop. 1993. Stress, corticoids and luteinizing hormone (LH) secretion in cattle. Biol. Reprod. (Suppl 1) 48:66.

3. Wettemann, R.P., H.A. Tucker, K.S. Lusby, D.K. Bishop, J.V. Yelich and J.A. Vizcarra. 1993. Melatonin treatment of postpartum beef cows decreases the interval from calving to conception. J. Anim. Sci (Suppl 1) 71:207.

4. Vizcarra, J.A., R.P. Wettemann, D.K. Bishop and M.P. Payton. 1993. Frequency of LH pulses in the bovine: Evaluation of different statistical procedures. 6th Annual Midwest reproductive Colloquium, Abstract #2.

5. Vizcarra, J.A., R.P. Wettemann, D.K. Bishop and M.E. Payton. 1993. Evaluation of methods to determine the frequency of LH pulses in beef cattle. J. Anim. Sci. (Suppl. 1) 71:18.

6. Vizcarra, J.A., R.P. Wettemann and G.L. Morgan. 1994. Relationship between amplitude, frequency and duration of exogenous GnRH pulses and concentrations of LH and FSH in serum of the bovine. Proc. Fourth Inter. Conf. on the Control of

the Onset of Puberty. p 9.

7. Yelich, J.V., R.P. Wettemann, T.T. Marston, J.A. Vizcarra and L.J. Spicer. 1994. Effect of growth rate on growth hormone (GH), LH and IGF-I in prepuberal beef heifers. J. Anim. Sci. (Suppl 1) 72:123.
8. Vizcarra, J.A., R.P. Wettemann and D.K. Bishop. 1994. Immunization of beef heifers against GnRH: effect of conjugation to different proteins. J. Anim. Sci. (Suppl. 2) 72:15.
9. Vizcarra, J.A. and R.P. Wettemann. 1994. Immunization of beef heifers against GnRH prevents luteal activity and pregnancy. J. Anim. Sci. (Suppl. 1) 72:1099.
10. Vizcarra, J.A., R.P. Wettemann and G.L. Morgan. 1994. Influence of amplitude, frequency and duration of infused GnRH pulses on secretion of LH and FSH in beef cows. J. Anim. Sci. (Suppl. 1) 72:122.
11. Vizcarra, J.A. and R.P. Wettemann. 1995. Precision of body condition scoring in beef cattle. J. Anim. Sci. (Suppl. 1) 73:29.
12. Hamilton, T.D., L.J. Spicer, R.P. Wettemann and J.A. Vizcarra. 1995. Influence of exogenous gonadotropin-releasing hormone on ovarian function in nutritionally anestrus cows. J. Anim. Sci. (Suppl. 1) 73:234.
13. Vizcarra, J.A., R.P. Wettemann, J.V. Yelich and S.D. Welty. 1995. Effect of GnRH pulse frequency on secretion of LH and FSH and luteal activity in nutritionally anestrus cows. J. Anim. Sci. (Suppl. 1) 73:223.
14. Looper, M.L., R.P. Wettemann and J.A. Vizcarra. 1996. Response of postpartum beef cows to treatment with GnRH and Prostaglandin F2a. J. Anim. Sci. (Suppl. 1) 74: (Abs 43)
15. Lents, C.A., R.P. Wettemann, J.A. Vizcarra, M.I. Duenas and M.J. Paape. 1996. Effect of administration of antibiotics to beef cows at weaning and calving on intramammary infections, milk somatic cell count, and calf growth. J. Anim. Sci. (Suppl. 1) 74: (Abs 44)
16. Bossis, I., S.D. Welty, R.P. Wettemann, J.A. Vizcarra and L.J. Spicer. 1996. Ovarian function before the onset of nutritionally induced anovulation in heifers. J. Anim. Sci. (Suppl. 1) 74: (Abs 39)
17. Vizcarra, J.A., R.P. Wettemann, J.C. Spitzer and D.G. Morrison. 1996. Body condition at parturition and postpartum weight gain influence luteal activity, glucose, insulin and NEFA concentrations in primiparus beef cows. J. Anim. Sci. (Suppl. 1) 74: (Abs 42)
18. Ojeda, A.J., R.P. Wettemann, J.A. Vizcarra and F.W. Owens. 1996. The effect of acute nutrient deprivation on LH secretion and blood components in steer. J. Anim. Sci. (Suppl. 1) 74: (Abs 444)
19. Looper, M.L., J.A. Vizcarra and R.P. Wettemann. 1996. Nutritional influence on LH and FSH pulse frequency and amplitude in beef cows: evaluation of different statistical methods. J. Anim. Sci. (Suppl. 1) 74: (Abs 445)
20. Lents, C.A., R.P. Wettemann, J.A. Vizcarra, M.I. Duenas and M.J. Paape. 1996. Effects of antibiotics on mammary function of beef cows with increased somatic cell counts in milk after parturition. J. Anim. Sci. (Suppl. 1) 74: (Abs 543)
21. Bossis, I., S.D. Welty, R.P. Wettemann, J.A. Vizcarra and L.J. Spicer. 1996. Pattern of follicular growth during nutritionally induced anestrus and resumption of cycles in beef heifers. J. Anim. Sci. (Suppl. 1) 74: (Abs 417)

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22. Vizcarra, J.A., R.P. Wettemann, T.D. Braden, A.M. Turzillo and T.M. Nett. 1996. Effect of GnRH pulse frequency on pituitary concentrations of LH and FSH, GnRH receptors (GnRH-R), gonadotropin subunit mRNA, and GnRH-R mRNA in anestrous cows. J. Anim. Sci. (Suppl. 1) 74: (Abs 496)
23. Bossis, I., S.D. Welty, R.P. Wettemann, J.A. Vizcarra and L.J. Spicer. 1997. Changes in serum LH and growth hormone concentrations before the onset of nutritionally induced anovulation in beef heifers. J. Anim. Sci. (Suppl. 1) 75: (S.S. Abs 65)
24. Vizcarra, J.A., R.P. Wettemann and T.D. Braden. 1997. The effect of duration of nutritional anestrus and GnRH treatment on pituitary LH, FSH and GnRH receptors in cows. J. Anim. Sci. (Suppl. 1) 75: (Abs 325).
25. Lents, C.A., R.P. Wettemann, J.A. Vizcarra, M.L. Looper and M.J. Paape. 1997. Dry cow treatment of beef cows: effects on mammary health and calf growth. J. Anim. Sci. (Suppl. 1) 75: (Abs 449).
26. Bossis, I., S.D. Welty, R.P. Wettemann, J.A. Vizcarra and L.J. Spicer. 1997. Serum FSH, plasma estradiol and IGF-I before the onset of nutritionally induced anovulation in beef heifers. J. Anim. Sci. (Suppl. 1) 75: (Abs 326).
27. Looper, L., C.A. Lents, J.A. Vizcarra and R.P. Wettemann. 1997. Evaluation of the effects of body condition on luteal activity and estrus in postpartum beef cows. J. Anim. Sci. (Suppl. 1) 75: (Abs 347).
28. Arelovich, H.M., F.N. Owens, G.W. Horn and J.A. Vizcarra. 1997. Effects of zinc and manganese concentrations on in vitro urea degradation and prairie hay disappearance. J. Anim. Sci. (Suppl. 1) 75: (Abs 471)
29. Prado, T.M., R.P. Wettemann, J.A. Vizcarra, L.J. Spicer and L.G. Morgan. 1997. Influence of Exogenous Gonadotropin-Releasing hormone on Ovarian function in Short vs Long Nutritionally Induced Anovulatory Beef Cows. Theriogenology
30. Lents, C.A., R.P. Wettemann, M.L. Looper, I. Bossis, L.J. Spicer and J.A. Vizcarra. 1998. Concentrations of GH, IGF-I, insulin and glucose in beef calves after birth. J. Anim. Sci. (Suppl. 1) 76: (Abs 64).
31. Arelovich, H.M., F.N. Owens, G.W. Horn and J.A. Vizcarra. 1998. Effects of high zinc levels on urea utilization by cattle fed prairie hay. J. Anim. Sci. (Suppl. 1) 76: (Abs 1410).
32. Bossis, I., R.P. Wettemann, J.A. Vizcarra and L.J. Spicer. 1998. Nutritionally induced anovulation in beef heifers: ovarian and endocrine function during realimentation. Biol. Reprod. (Suppl. 1) 58: (Abs 206).
33. Vizcarra, J.A., A.G. Hernandez, J.M. Bahr, W.J. Kuenzel, D.L. Kreider, and J.D. Kirby. 1998. Rescue of impaired spermatogenesis in adult male fowl following unrestricted prepubertal growth and subsequent growth restriction. Biol. Reprod. (Suppl. 1) 58: (Abs 105).
34. Looper, M.L., J.A. Vizcarra, R.P. Wettemann, J.R. Malayer, T.D. Braden, and R.D. Geisert. 1999. Influence of Progesterone and Estradiol on Pituitary Gland GnRH Receptors, Gonadotropins and Gene Expression for GnRH Receptor and Gonadotropin Subunits in Nutritionally Induced Anovulatory Beef Cows. J. Anim. Sci. (Suppl. 1) 77:2 (Abs 4).
35. Kirby, J.D., J.A. Vizcarra, M.L. Rhoads, A. Shepard, J. Washington and D.L. Kreider. 1999. FSH and testis function in broiler breeder males: Insight gained from broilerized breeder males. Poultry Sci. (Suppl. 1) 78:5 (Abs 20) submitted).
36. Morgan, J.L.M., J. Yang, J.A. Vizcarra, D.W. Long, W.L. Bacon, and J.D. Kirby. 1999. Development of the circadian rhythms of body temperature and motor

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activity associated with the onset of laying in turkey hens. Poultry Sci. (Suppl. 1) 78:35 (Abs 149).

37. Bacon, W.L. , D.W. Long, J.L.M. Morgan, J. Yang, J.A. Vizcarra, and J.D. Kirby. 1999. Frequency of luteinizing hormone (LH) surges at initiation of egg laying in turkeys photostimulated with either continuous (24L:0D) or 14L:10D lighting treatments. International Conference Bird Reproduction.

38. Vizcarra, J.A., J.L.M. Morgan, M.L. Rhoads, J. Hsu, H. Tang, C. Bright, and J.D. Kirby. 1999. Gonadotropin Secretion in the Mature Fowl: Serial Blood sampling from Unrestrained Male Broiler Breeders. Poultry Sci. (Suppl. 1) 78:34 (Abs 146).

39. Vizcarra, J.A., M.L. Rhoads, and J.D. Kirby. 2000. Regulation of testis development and fertility in broilerized breeder males. Poultry Sci. 79 (Suppl 1): 78 (Abs 341).

40. Vizcarra, J.A., M.L. Rhoads, D.L. Kreider, and J.D. Kirby. 2000. Testis development and gonadotropin secretion in male broiler breeders. Poultry Sci. 79 (Suppl 1): 78 (Abs 342).

41. Vizcarra, J.A., M.L. Rhoads, C. C. Hsu, J. Washington, J.L.M. Morgan, J. Yang, H. Tang, J. Warren, and J.D. Kirby. 2000. Effect of immunization against chicken gonadotropin releasing hormone -I (cGnRH-I) and cGnRH-II on reproductive function in adult broiler breeder males. Poultry Sci. 79 (Suppl 1): 79 (Abs 343).

INTERNATIONAL MISCELLANEOUS PUBLICATIONS

1. Mendez, J., J.A. Vizcarra, R. Orcasberro and D. Vaz Martins. 1986. Body condition score during breeding and pregnancy rate in Hereford beef cows. (Condición corporal durante el entore y preñez en vacas Hereford). Revista Argentina de Producción Animal (supl. 1) 6:108.

2. Cavestany, D., J. Vizcarra, W. Cardozo, F. Perdigon, R. Tagle, S. Quma and S. Lanzzeri. 1990. Studies on post-partum reproductive performance of Hereford beef cows in Uruguay with the aid of progesterone assay. In: Livestock reproduction in Latin America. Proceedings of the final research co-ordination meeting of the FAO/IAEA/ARCAI III regional network for improving the reproductive management of meat and milk producing livestock in Latin America with the aid of radioimmunoassay. pp 257-267. Vienna, Austria, International Atomic Energy Agency.

3. Wettemann, R.P. and J.A. Vizcarra. 1995. Age and season influence the body condition of cows at the onset of nutritionally induced anoestrus. Journal of Reproduction and Fertility 15(Abs):66. Dublin, Ireland.

4. Kirby, J.D., J.A. Vizcarra, C. Joy Hsu, Marsha L. Rhoads, J.L.M. Morgan and D.L. Kreider. 2000. Broilerization suppresses the hypothalamo-hypophyseal-testicular axis in the fowl. VII International Symposium on Avian Endocrinology. Banaras Hindu University, Varanasi, U.P. India.

EXTENSION PUBLICATIONS

1. Vizcarra, J.A. 1989. Body condition score by visual observation in Hereford cows. (Condición corporal por apreciación visual en vacas Hereford). FUCREA Bulletin, CREA-Uruguay. Comunicación No. 151. p 23.

2. Vizcarra, J.A., R.P. Wettemann, D.K. Bishop and R. Wright. 1991. Relationship between the occurrence of puberty and the cessation of luteal activity after nutritional restriction. Proceedings Beef Cattle Research Day, p.26.

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