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(*in vitro*)

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x

1. *Lathyrus L.*

2. *Vicia Villosa*

3. *Leguminosae*

4. *Ferula L.*

5. *Prangus L.*

6. *Umbelliferae*

7. *Bromus tomentellus*

8. *Taeniatherum L.*

9. *Hordeum bulbosum*

10. *Festuca ovina*

11. *Agropyron tauri*

12. *Agropyron trichophorum*

( *in vitro* )

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$$P = a + b(1 - e^{-ct})$$

c

b

a

P

(ERD)

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$$ERD = a + bc/(c+k)$$

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$$Y_{ij} = \mu + T_i + e_{ij}$$

$\mu$

$Y_{ij}$

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$e_{ij}$

$T_i$

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Proc GLM ( ) SAS

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pH ( / / )

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/ ± / <sup>d</sup>	/ ± / <sup>d</sup>	/ ± / <sup>d</sup>
/ ± / <sup>b</sup>	/ ± / <sup>b</sup>	/ ± / <sup>b</sup>
/ ± / <sup>a</sup>	/ ± / <sup>a</sup>	/ ± / <sup>a</sup>
/ ± / <sup>c</sup>	/ ± / <sup>c</sup>	/ ± / <sup>c</sup>
/ ± / <sup>bc</sup>	/ ± / <sup>c</sup>	/ ± / <sup>bc</sup>
/ ± / <sup>e</sup>	/ ± / <sup>d</sup>	/ ± / <sup>d</sup>
/ ± / <sup>f</sup>	/ ± / <sup>e</sup>	/ ± / <sup>e</sup>
/ ± / <sup>h</sup>	/ ± / <sup>f</sup>	/ ± / <sup>g</sup>
/ ± / <sup>g</sup>	/ ± / <sup>f</sup>	/ ± / <sup>f</sup>

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(SEM)

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/ b	/ a	/ b	/ e	/ fg	/ a
/ a	/ a	/ a	/ b	/ d	/ b
/ e	/ b	/ c	/ f	/ b	/ e
/ f	/ b	/ c	/ f	/ a	/ f
/ g	/ c	/ e	/ b	/ c	/ g
/ h	/ d	/ f	/ g	/ e	/ g
/ j	/ f	/ h	/ a	/ h	/ i
/ i	/ e	/ g	/ d	/ g	/ h
/	/	/	/	/	(SEM)

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(P< / )

( $p < /$ )

( $r^2 = /$ )

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( $p <$

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/ a	/ a	/ a	/ e	/ b	/ a	
/ cd	/ f	/ d	/ h	/ d	/ a	
/ c	/ d	/ c	/ h	/ a	/ b	
/ e	/ h	/ e	/ f	/ e	/ d	
/ bc	/ c	/ d	/ a	/ f	/ c	
/ c	/ e	/ de	/ cd	/ g	/ a	
/ e	/ i	/ f	/ b	/ g	/ d	
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/ e	/ d	/ d	/ d	/ a	/ c		
/ c	/ c	/ c	/ d	/ ab	/ b		
/ d	/ d	/ ef	/ b	/ c	/ f		
/ h	/ f	/ g	/ c	/ de	/ e		
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/ i	/ g	/ h	/ e	/ ef	/ f		
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(P < / )

## REFERENCES

5. AOAC.1990.Official methods of analysis of the association of official analytical chemists. 15th ed. Washington, DC. USA.
6. Hvelplund T. & M.R. Weisbjerg. 2000. *In situ* techniques for the estimation of protein degradability & postpartum availability. Eds. Givens, D.J., E. Owen, R.F.F. Axford and H.M. Omed. p.233-258. CAB International Publishing. UK.
7. Madsen, J., T. Stensig, M. R. Weisbjerg, & T. Hvelplund.1994. Estimation of the physical fill of feedstuffs in the rumen by the *in situ* degradation characteristics. Livestock Prod. Sci. 39, 43–47.
8. Mertens, D.R. 1993. Kinetics of cell wall digestion and passage in ruminants. Chapter 21.Quantitative aspects of ruminant digestion and metabolism. Edited by forbes and france.
9. National Research Council, 2001. Nutrient Requirements of Dairy Cattle, seventh revised ed. National Academy of Sciences, Washington, DC.

10. Orskov, E.R., & I. McDonald. 1979. The estimation of protein degradability in the rumen from incubation measurements weighted according to rate of passage. *J. Agric. Sci.* 92, 499–503.
11. SAS. 1996. Statistical Analysis Systems Institute Inc. Procedures Guide For Personal Computers. Version 6.12, SAS Institute Inc., Cary, NC.
12. Steel, R.G.D. & J.H., Torrie. 1980. Principles and Procedures of Statistics: A Biometrical Approach, 2nd ed., McGraw Hill, New York, NY, USA, pp. 187-188.
13. Tilley, J.M.A. & R.A. Terry. 1963. A two stage technique for the *in vitro* digestion of forage crops. *J. Br. Grass. Soc.* 18:104.
14. Van Soest, P.J. 1994. Nutritional Ecology of the Ruminants, 2nd edn. Cornell University Press, Ithaca, New York, USA.
15. Van Soest, P.J., J. B. Robertson, & B. A. Lewis. 1991. Methods for dietary fiber, neutral detergent fiber and non-starch polysaccharides in relation to animal nutrition. *J. Dairy Sci.* 74, 3583–3597.
16. Weisbjerg, M.R., P. K. Bhargava, T. Hvelplund, & J. Madsen. 1990. Use of degradation curves in feed evaluation, Report no. 679. National Institute of Animal Science, Frederiksberg, DK.
17. Weiss, W. P. 1993. Symposium: Prevailing concepts in energy utilization by ruminants. Predicting energy values of feeds. *J. Dairy Sci.* 76:1802-1811.