

# Growth Performance of Draft Cross weanlings Fed Forage Based Total Mixed Ration Cubes Versus Traditional Hay/Concentrate Rations

Sarah . L. Ralston<sup>1</sup>, Harlan Anderson<sup>2</sup>, Roy Johnson<sup>3</sup>

<sup>1</sup>Rutgers, the State University of New Jersey, New Brunswick, NJ; <sup>2</sup>Idleacres, Cokato, MN; <sup>3</sup>Nutrena, Minnetonka, MN

## Introduction

Total mixed rations (TMR), wherein all the nutritional needs of the animals are met in a single feedstuff that is available free choice, are commonly used in other species. The tradition in horses, however, is to provide forage (pasture and/or hay) and concentrates separately and in limited amounts. However, it is increasingly hard to insure a consistent, high quality source of forage. The fluctuations in nutrient content of the forages make it difficult to provide balanced nutrition, which is especially a problem in rapidly growing horses (1, 2).

Forage based TMR cubes could be a solution for breeders faced with variable and/or limited forage sources. It was hypothesized that TMR cubes could be formulated to be offered free choice to weanlings to support growth rates equal to or greater than those fed a hay/concentrate ration.

## Objectives

To compare growth rates of draft cross weanlings fed TMR cubes as the sole source of nutrition versus traditional hay/concentrate rations.

## Methods

A series of three trials were conducted (2004-2006). Each year 12 draft cross weanlings were paired by sex and type and fed either TMR cubes (Next Generation™, Idleacres, Cokato, MN) free choice (TMR) or Nutrena ®(Minnetonka, MN) Life Design ®Youth ® (2004, 2005) (HY) or SafeChoice ® (2006) (HSC) to provide 50% of the calories recommended for growth (3) with ad libitum grass/alfalfa mix hay for 5-6 weeks. The horses were fed their rations in individual stalls from 1600h-0830 hr and turned out in a dry lot paddock 0830-1600h daily. Hay and cube orts were recorded daily. Horses were weighed and measured weekly. Data were analyzed by ANOVA across years and Students t-test within years with significance set at P<0.05.

Weanling eating the TMR ration



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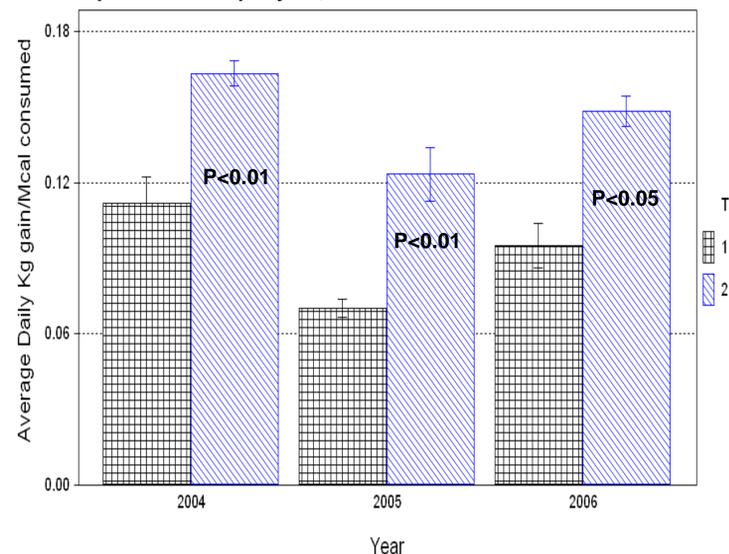
Yearling fed exclusively TMR cubes for 7 months



Table 1: Nutrient Intake-100% DM basis of rations used in the 3 trials Based on recorded daily intakes.

Year/Feed	2004 HY	2004 TMR	2005 HY	2005 TMR	2006 HSC	2006 TMR
DE Mcal/kg	2.4	2.2	2.2	2.2	2.6	2.4
% Protein	14.0	18.2	11.0	16.7	14.7	15.6
%ADF	31.8	28.5	29.5	38.8	28.4	35.1
%NSC	20.0	16.5	20.0	13.0	15.4	15.0
%Ca	0.88	1.47	0.73	1.07	1.0	1.18
% Phos	0.45	0.42	0.37	0.35	0.52	0.34
%Mg	0.39	0.32	0.16	0.29	0.31	0.27

Figure 1: Feed Efficiency. Means+/-SE for 6 weanlings per treatment per year, 7 weeks of data collection



Tx1=Youth in 2004, 2005, Safe Choice 2006, Tx2=TMR cubes all years

Figure 2: Average daily gain (Kg). Means+/-SE for 6 weanlings per treatment per year, 7 weeks of data collection

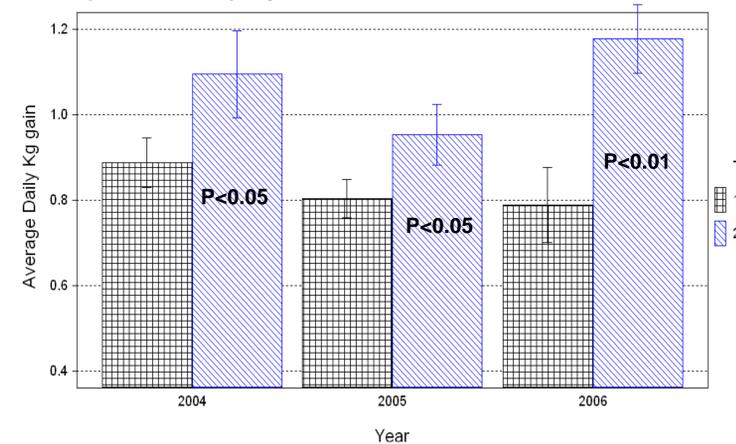
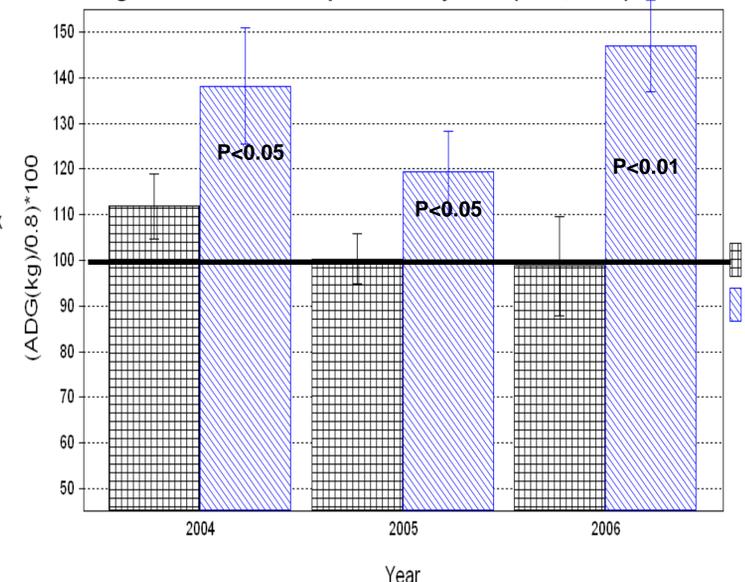


Figure 3: Percent ADG predicted by NRC (1989, 2007)



Tx1=Youth in 2004, 2005, Safe Choice 2006, Tx2=TMR cubes all years

## Results and Discussion

Nutrient content of the rations, based on actual amounts consumed, differed somewhat between years (Table 1). In 2004 all 12 weanlings were Belgian/QH crosses, in 2005, 2006, 4 and 6 weanlings respectively, were Hanoverian/TB/Percheron/QH crosses (only ¼ draft).

All weanlings maintained good health and body condition (condition scores of 5-7) in all years. There was no observed wood chewing activity in the stalls on either treatment, though both groups in all years tended to chew wood fences when turned out in the dry lot paddocks during the day.

The TMR cube fed horses were consistently more efficient (P<0.01) than horses on HG, consuming fewer calories per kg gain in all three years (Figure 1) and gained more (P<0.05) weight per kg BW per day (Figure 2) than the hay/concentrate fed horses.

It is of interest to note that the draft cross weanlings, regardless of dietary treatment, voluntarily consumed <90% of NRC(2) recommended calories for moderate growth (>600kg estimated mature weight) but sustained growth rates 90-143% of the 0.8kg/day predicted (Figure 3). In 2005 the quality of the hay was only moderate, whereas good quality hays were used in 2004 and 2006. The use of a different concentrate in 2006 did not affect the overall results.

## Conclusions

Based on the results of these trials, feeding TMR cubes formulated for growth free choice to draft cross weanlings is a safe and effective alternative to traditional hay/concentrate rations. The 1989 and 2007 NRC caloric recommendations for growth may be in excess of the needs of draft cross weanlings.

## References

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