

# YEAST CULTURE HORSE RESEARCH REPORT 1994-1

## EFFECT OF YEAST CULTURE ON GROWTH IN YEARLING QUARTER HORSES

### Summary

Fourteen yearling Quarter Horses were randomly blocked into two treatment groups. Both groups were fed a restricted basal diet which exceeded NRC nutrient requirements for moderate to rapid growth. They were fed on the basis of percent body weight and one group was given yeast culture as a top-dress.

The yeast culture yearlings were 4.1 kg heavier at the end of the trial, representing a 3% increase in total weight gain over the control yearlings. Feed efficiency was numerically improved 7-10% by feeding yeast culture, with the greatest response taking place during the last 5 months of the study. In addition to body weight gain, the yeast culture yearlings had a 7% greater withers height gain and a 23% greater hip height gain than the controls. There was no difference in third metacarpal bone diameter, circumference or estimated bone density (as measured by densitometry radiography) or serum osteocalcin protein levels. Treatment differences were not statistically significant ( $P > .05$ ), but hip height gain difference approached significance ( $P = .06$ ).

### Materials and methods

Fourteen Quarter Horse yearlings, averaging 228 kg body weight, were randomly blocked by sex, age and sire into two treatment groups: Control (C) and Yeast Culture (YC). Both groups were treated identical with the exception of the YC group receiving 58 gm yeast culture (Diamond V "XP", Cedar Rapids, IA) per day top dressed on the concentrate portion of their diet, in two separate feedings. Both groups were fed a diet formulated to meet moderate to fast growth based on NRC.

All horses were weighed weekly and feed intake adjusted as a percentage of individual body weights (table 1). The horses were housed in individual stalls and allowed

Table 1: Weekly feeding schedule.

Week	Feeding Rate (% Body Wt.)	Percent of Diet	
		Grain	Hay
2-3	3.00	50	50
4-5	3.00	55	45
6-14	2.75	60	40
15-20	2.50	60	40
21-26	2.25	60	40

**Note: The diet fed from week 6 to 26 contained 89.1% dry matter, 11.5% crude protein, 17.8% crude fiber, 0.32% calcium and 0.32% phosphorus on an as-fed basis.**

free access to water and salt. Exercise was provided five days per week by either group turnout or free lunging for 10 minutes each day.

Measurements of withers height, hip height, body length and cannon bone circumference were taken at six week intervals. Body length was measured from the point of the shoulder to the furthest hip point of the buttocks. Cannon bone circumference was measured at the midpoint of the left third metacarpal. Metacarpal bone density was estimated by reading the optical density of dorso-palmar radiographs with a densitometer and dividing by the bone diameter. Blood samples for the serum osteocalcin measurements were taken from five yearlings (three colts and two fillies) in each group. A commercially available  $I^{125}$  radioimmunoassay kit was used for osteocalcin analysis (Instar, Stillwater, MN).

### Results and discussion

The initial and final parameter values measured in the study and their net gains are presented in table 2. Feed efficiency ratios corresponding to the changes in feeding rates are reported in figure 1.

**Table 2: Effect of yeast culture on growth performance and skeletal characteristics of yearling Quarter Horses.**

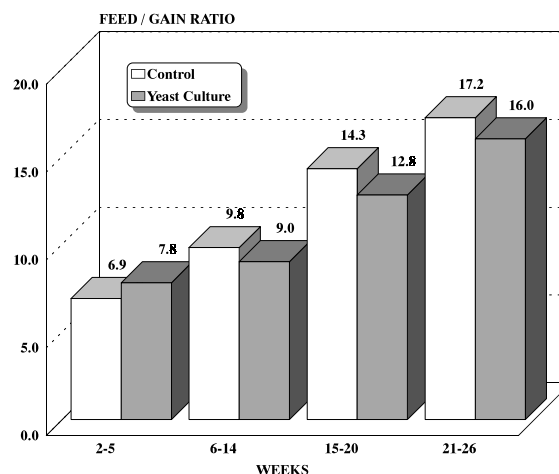
	Control	Yeast Culture
<b>Body Weight, kg</b>		
Initial	228.1	228.1
Final	359.9	364.0
Gain	131.8	135.9
<b>Withers Height, cm</b>		
Initial	128.4	127.9
Final	139.7	140.0
Gain	11.3	12.1
<b>Hip Height, cm</b>		
Initial	134.1	133.6
Final	143.6	145.3
Gain	9.5 <sup>a</sup>	11.7 <sup>b</sup>
<b>Body Length, cm</b>		
Initial	121.6	122.9
Final	141.9	142.6
Gain	20.3	19.7
<b>Metacarpal Diameter, cm</b>		
Initial	3.0	2.9
Final	3.3	3.2
Gain	0.3	0.3
<b>Metacarpal Circumference, cm</b>		
Initial	15.5	15.8
Final	17.7	17.9
Gain	2.2	2.1
<b>Metacarpal Bone Density, film OD/diameter</b>		
Initial	0.47	0.49
Final	0.31	0.31
Gain	-0.16	-0.18
<b>Serum Osteocalcin, ng/ml</b>		
Initial	16.8	17.6
Final	16.4	16.2
Gain	-0.4	-1.4

<sup>ab</sup> Difference approached significance (P=.06).

At the end of the study, the YC yearlings were 4.1 kg heavier than the C group, representing a 3.1% increase in weight gain. Withers height and hip height gains were 7.0% and 23.1% greater, respectively, in the YC group versus the C group, while body length gain was slightly greater in the C group. None of these differences were significant statistically (P>.05), but the difference in hip height gain approached significance (P=.06). There were no differences in metacarpal diameter, circumference or bone density, or serum osteocalcin protein levels between the groups (P>.10).

Although not significant (P>.05), feed efficiency tended to be improved by yeast culture after the first five weeks. Feed to gain ratios were 7-10% lower for the YC group during the last five months of the study, indicating improved digestibility and growth performance when yeast culture was fed.

**Figure 1: Effect of yeast culture on feed efficiency in growing yearling Quarter Horses.**



#### Research source

Karen Bennett-Wimbush. 1991. Master of Science Thesis. University of Missouri, Columbia.