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Nutrition 1
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THE EFFECT OF A NUTRIENT SUPPLEMENT ON THE RESPIRATION, PULSE, TEMPERATURE, SWEATING, AND SERUM ELECTROLYTE AND AMINO ACID LEVELS OF ANHIDROTIC HORSES

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Anhidrosis is a significant health problem in even sedentary horses living in hot, humid climates. The purpose of this study was to determine if an oral nutritional supplement would alleviate clinical signs of anhidrosis, such as absent or abnormal sweat patterns, increased respiratory rates and increased body temperature, in anhidrotic horses. Twelve anhidrotic and four control (normal) horses were observed under mostly pasture conditions for eight weeks during the months of July and August. At the beginning of the study, the anhidrotic horses were started on an oral supplement containing vitamin C, L-tyrosine, niacin and cobalt at a level of 17 mg/kg body weight twice daily in the regular grain ration. Respiration and pulse rates, body temperature and Jenkinson sweat pattern scores (Jenkinson, 1989) were taken between 1000 and 1700 h four days per week. At 0, 4 and 8 weeks terbutaline sweat blot tests and blood samples were taken.

The overall mean respiration rate, pulse rate and body temperature for both groups of horses were not different ($P<.03$). A group by week interaction ($P<.05$) was seen for all factors except the Jenkinson sweat pattern scores of the control group. The respiration and pulse rates and body temperature means for the control group were higher during the beginning and end but lower in the middle of the study ($P<.05$). The anhidrotic group showed a decrease, either linear or quadratic, in respiration rates, body temperature and Jenkinson sweat pattern score throughout the study ($P<.03$). The Jenkinson sweat pattern scores of the anhidrotic group were similar to the control group by the eighth week. The anhidrotic group means for weeks 1, 2, 3, 4, 5, 6, 7 and 8 were: respiration (expirations/min) - 63, 56, 40, 46, 46, 38, 46, and 47 ; pulse (beats/min) - 44, 42, 42, 41, 41, 40, 42 and 42; body temperature (°C) - 38.5, 38.3, 38.2, 38.2, 38.1, 38.0, 38.2 and 38.2; Jenkinson sweat pattern score - 63, 66, 62, 62, 59, 55, 49 and 46, respectively. No group differences were found for the terbutaline sweat blot tests, which measure the sweat capacity of the individual sweat glands. There were no mean differences between groups for any of the serum electrolytes measured (Mg, Na, K, P, Ca and Cl) or for most of the serum amino acids (tyr, phe, his, lys, trp, arg, pro, ile and leu). The mean serum alanine was higher (120 vs 97 µM/ml, $P<.005$) and mean serum methionine was lower (6.15 vs 5.19 µM/ml, $P<.10$) for the treated group compared to the controls. Many of the serum electrolytes and amino acids showed time differences and/or time-group interactions. The dietary supplement appeared to improve heat dissipation in non-exercised anhidrotic horses by increasing the amount of body sweat area.

Must be received by July 8, 1994. Send original and three copies to program chairman: Bob Coleman, Alberta Agriculture, Food and Rural Development, #905, 6909-116 Street, Edmonton, Alberta, Canada, T6H 4P2. Fill out attached abstract receipt form, front and back, and return with your abstract.

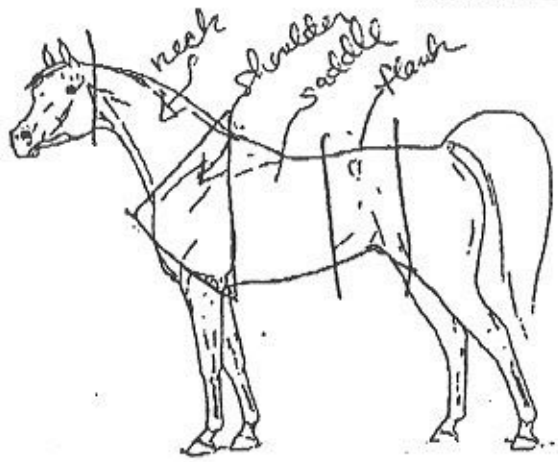
Anhidrosis Project HN 934 Horse # _____

PHYSIOLOGICAL RECORDS

Date _____ Time_____ Sun / Cloudy / Breeze /_____
Respiration (exp/min) _____ Pulse (beats/min) _____
Rectal temperature (F) _____ _____
Ambient temperature (F)_____ Relative Humidity _____
Jenkinson sweat assessment:

	shoulder	neck	saddle	flank	total
overall sweating	0	0	0	0	0
slight sweating	10	10	10	15	_____
no sweating	20	20	20	25	_____
				total	_____

Outline areas of sweat
(made when horse at rest/
after _____ mininutes
of exercise):
(sweat is not salty / salty)



Date _____ Time_____ Sun / Cloudy / Breeze / _____
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Rectal temperature (F) _____ _____
Ambient temperature (F)_____ Relative Humidity _____
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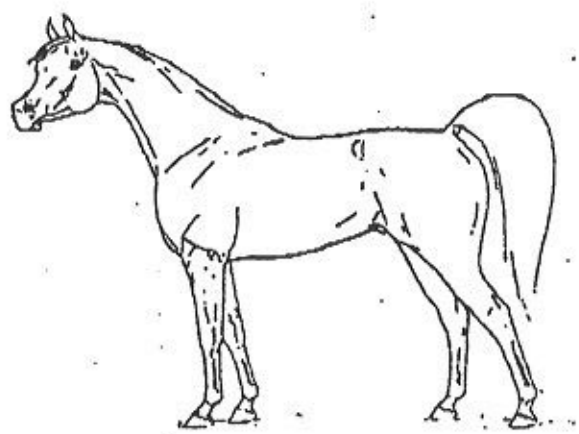

General Linear Models Procedure
Least Squares Means

GRP	RR LSMEAN	PR LSMEAN	BODTEMP LSMEAN	JS LSMEAN
con	38.3593750	40.5625000	100.607812	46.4062500
trt	47.8750000	41.8333333	100.792969	57.8255208

WK	RR LSMEAN	PR LSMEAN	BODTEMP LSMEAN	JS LSMEAN
1	56.0833333	44.6666667	101.127083	52.7083333
2	49.3333333	41.6666667	100.897917	55.8333333
3	34.4166667	40.8958333	100.581250	55.7291667
4	39.5625000	40.0833333	100.569792	54.3229167
5	42.5416667	41.1666667	100.596875	52.9166667
6	34.2500000	39.2916667	100.462500	55.5208333
7	41.0208333	40.2291667	100.615625	48.3854167
8	47.7291667	41.5833333	100.752083	41.5104167

GRP	WK	RR LSMEAN	PR LSMEAN	BODTEMP LSMEAN	JS LSMEAN
con	1	49.0000000	45.2500000	100.975000	42.1875000
con	2	42.3750000	41.2500000	100.806250	45.6250000
con	3	28.5000000	39.6250000	100.462500	49.3750000
con	4	33.1250000	39.0000000	100.418750	46.5625000
con	5	38.8750000	40.8750000	100.568750	46.8750000
con	6	30.1250000	38.6250000	100.418750	55.6250000
con	7	36.5000000	38.3750000	100.512500	47.5000000
con	8	48.3750000	41.5000000	100.700000	37.5000000
trt	1	63.1666667	44.0833333	101.279167	63.2291667
trt	2	56.2916667	42.0833333	100.989583	66.0416667
trt	3	40.3333333	42.1666667	100.700000	62.0833333
trt	4	46.0000000	41.1666667	100.720833	62.0833333
trt	5	46.2083333	41.4583333	100.625000	58.9583333
trt	6	38.3750000	39.9583333	100.506250	55.4166667
trt	7	45.5416667	42.0833333	100.718750	49.2708333
trt	8	47.0833333	41.6666667	100.804167	45.5208333