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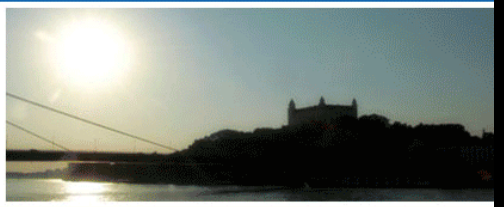

Bratislava, SLOVAKIA

Session 34 - Horse business meeting and free communications

IN VIVO PERFORMANCE OF ITALIAN HEAVY DRAUGHT HORSE FOALS FED TWO DIETS WITH DIFFERENT PROTEIN LEVELS

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BACKGROUND

- Italian Heavy Draught Horse breed is the only coldblood autochthon breed reared in Italy for meat production and heavy draught
- Meat production is usually obtained with young foals aged about 12 mo. if reared in stables, or aged 18 mo. if reared in wild or semi-wild condition (i.e., lower growth at pasture requires a fattening period before slaughter)
- Lack of knowledge on feeding practice and correct growth up to slaughter for IHDH breed
- Possible benefit from diets aimed at maintaining animal welfare but more cheap and at low environmental impact (i.e., N pollution)

AIM

To evaluate *in vivo* and *post mortem* performance of IHDH foals reared under standard conditions with isoenergetic diets but with different levels of crude protein and slaughtered at 2 typical ages (i.e., approx. at 12 and 18 mo. of age)

MATERIALS AND METHODS

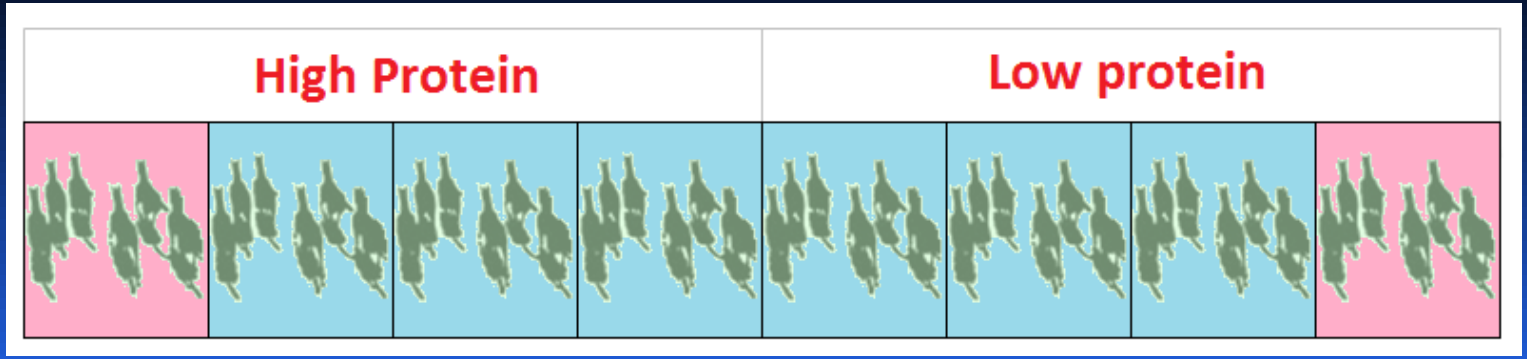
- Animals: 47 Italian Heavy Draft Horse foals by two slaughter ages, i.e., 13 mo. (n=25; 1st period) and 18 mo. of age (n=22; 2nd period)
- Initial records: age 274 ± 35 d, BW 339 ± 52 kg
- Site: experimental farm of the University of Padua
- Veterinary treatments: against equine worms (Equalan duo, Merial Animal Health, UK) at arrival and after 6 months
  + initial broad spectrum antibiotic treatment (Norodine 24, Bayer S.p.A., Milan, Italy)
- Experimental units: 8 groups of animals (approx. 6 foals/group) randomly allocated by sex, age and BW in 8 pens of about 34 m^2, on wheat straw bedding partially renewed every 3 to 4 d

EXPERIMENTAL DESIGN

- Adaptation diet for the first 28 d;
- Pens were assigned to 2 experimental isoenergetic diets at different protein contents in 2 subsequent periods

DIET	% CP on DM	
	First period (9-13 mo. age)	Second period (13-18 mo. age)
Low protein (LP)	11.4	14.4
High protein (HP)	12.1	15.7

- Horses received diets as TMR *ad libitum*
- Females were placed in 2 pens at the ends of the barn



DIETS

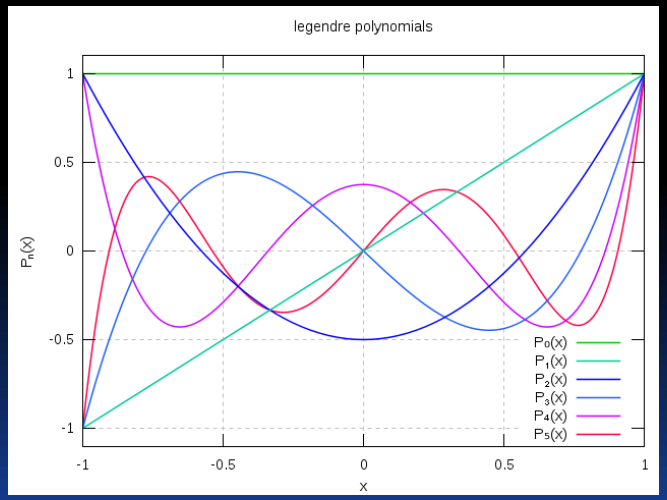
	First period		Second period	
	Low CP	High CP	Low CP	High CP
Ingredients:				
- Meadow hay	31.8	30.6	23.0	26.7
- Corn silage	18.6	18.6	22.9	19.2
- Corn meal	17.7	13.0	18.8	11.9
- Dried beet pulp	10.9	10.9	12.8	11.7
- Wheat bran	18.7	17.5	19.1	17.0
- Soybean meal	2.4	9.5	3.4	13.4
Chemical comp.:				
- DM	67.0	66.9	63.2	66.3
- CP	10.5	13.2	11.2	14.8
- Lipids	2.4	2.3	2.5	2.3
- NSC	38.6	36.3	40.9	36.4
- NDF	43.3	42.8	40.6	41.2
- DE (MJ/kg of DM)	2.84	2.84	2.92	2.88
- HFU/kg of DM	0.80	0.80	0.81	0.81

DATA RECORDING

- Daily amount of feed distributed as TMR and periodical collection of feed residuals to estimate the actual intake
- At three weeks interval:
  - Body weight
  - Withers height
  - Conformation score (from 1 = all muscle profiles to very concave to 5 = all muscle profiles extremely convex)
  - Fat covering (from 1 = very lean to 5 = very fat)
  - Locomotion score with a 1-5 point scale (1 = sound and 5= severe lame)
- At slaughter:
  - Carcass weight, conformation score and fat covering

STATISTICS

- All data recorded *in vivo* and *post mortem* were analyzed using the same hierarchical linear model accounting for the effects of diet, sex, diet*sex, and pen(diet*sex) as error term for previous effects
- For feed intake also the diet*period effect was considered
- Growth patterns were estimated within period for diet, sex and diet*sex by modeling BW as a function of age using a 4^{th} degree Legendre polynomial



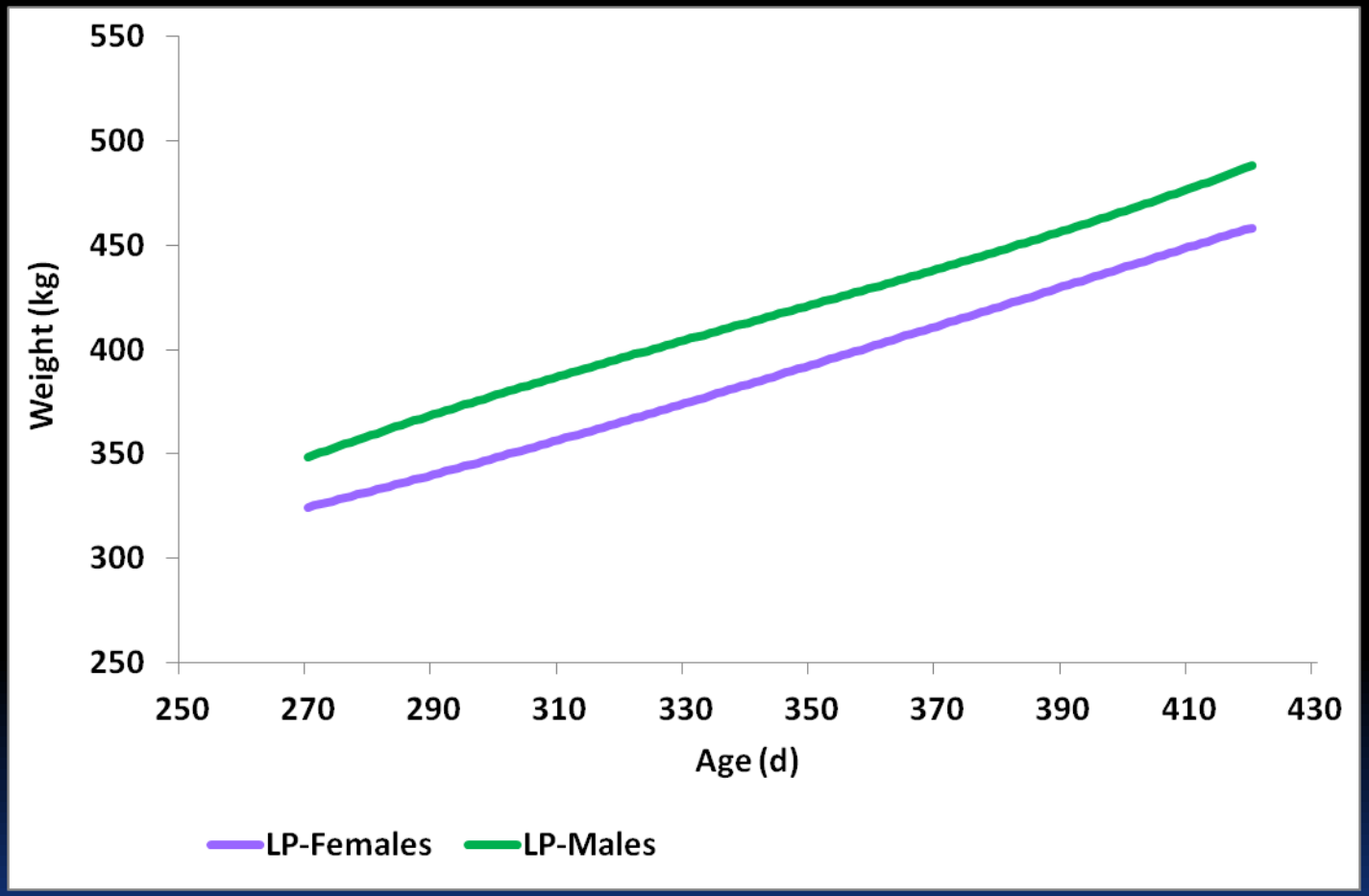
LSMEANS & SIGNIFICANCE - FIRST PERIOD

	Low Protein		High Protein		P-value			Initial age	
Item:	Male	Female	Male	Female	Diet	Sex	DxS	b	P
ADG, kg/d	1.02	0.93	1.07	1.15	ns	ns	ns	-	-
BW, kg	471	454	486	484	ns	ns	ns	0.92	0.007
Withers height, cm	142	139	142	139	ns	ns	ns	0.07	0.015
Conformation	2.89	2.88	2.76	2.78	ns	ns	ns	0.005	0.035
Fat covering	2.47	2.50	2.42	2.42	ns	ns	ns	-	ns

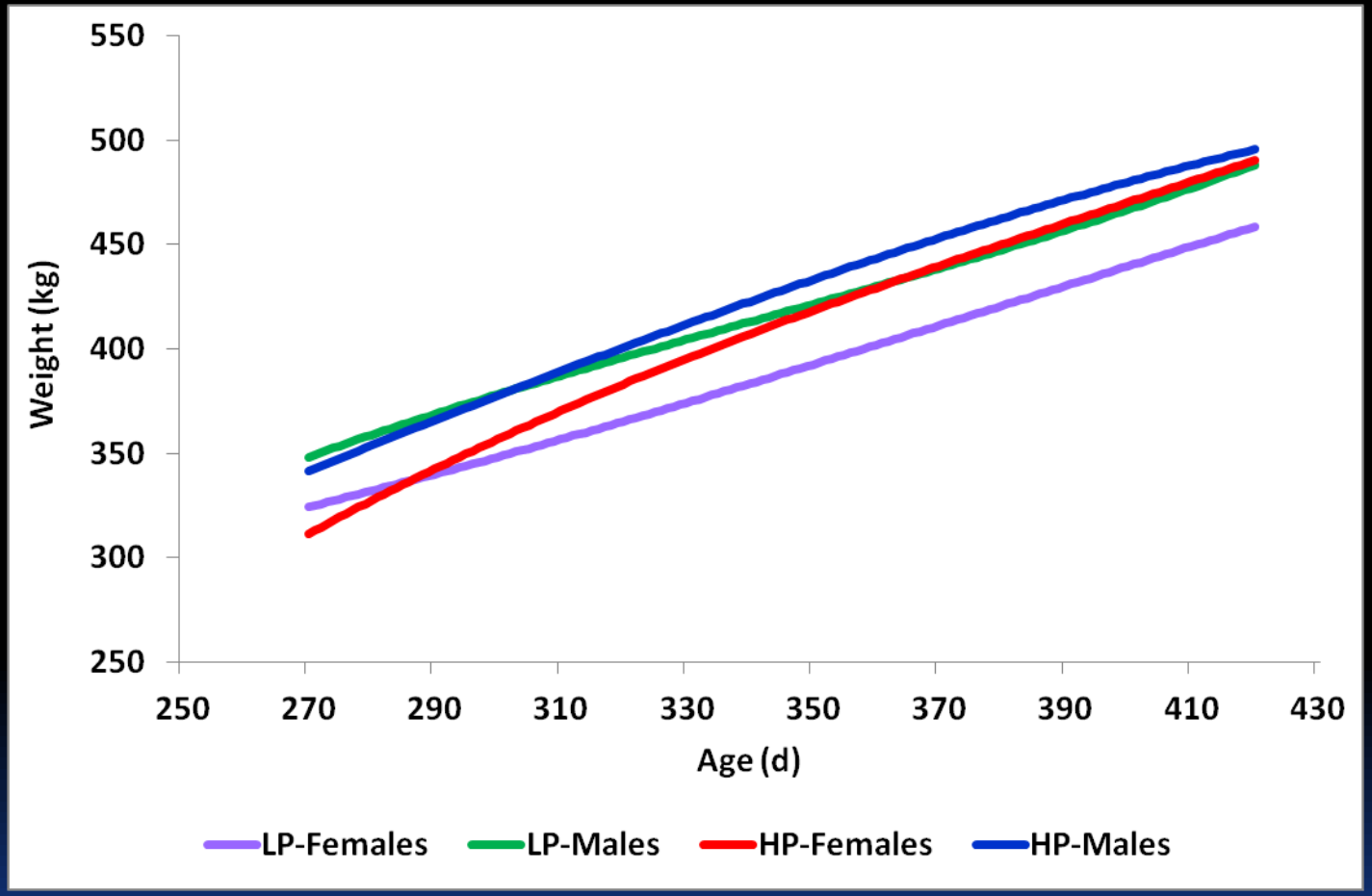
LSMEANS & SIGNIFICANCE - SECOND PERIOD

	Low Protein		High Protein		P-value			Initial age	
Item:	Male	Female	Male	Female	Diet	Sex	DxS	b	P
ADG, kg/d	1.12	1.37	1.24	0.99	ns	ns	ns		
BW, kg	568	598	622	585	ns	ns	0.04	-	ns
Withers height, cm	142	142	147	143	0.03	ns	ns	-	ns
Conformation	2.89	3.33	3.05	2.77	ns	ns	ns	-	ns
Fat covering	2.60	2.62	2.73	2.40	ns	ns	0.04	-	ns

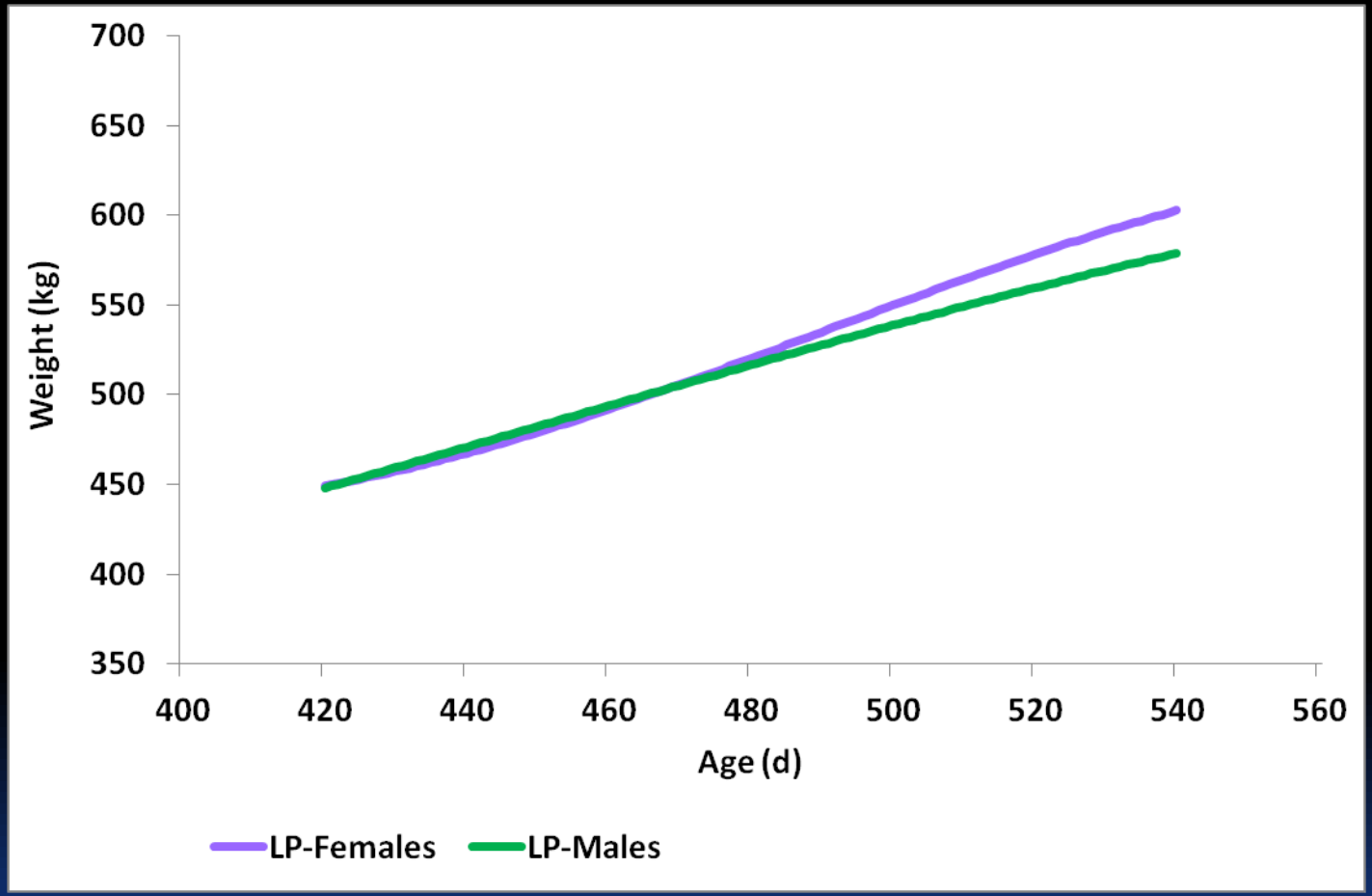
GROWTH CURVES - FIRST PERIOD



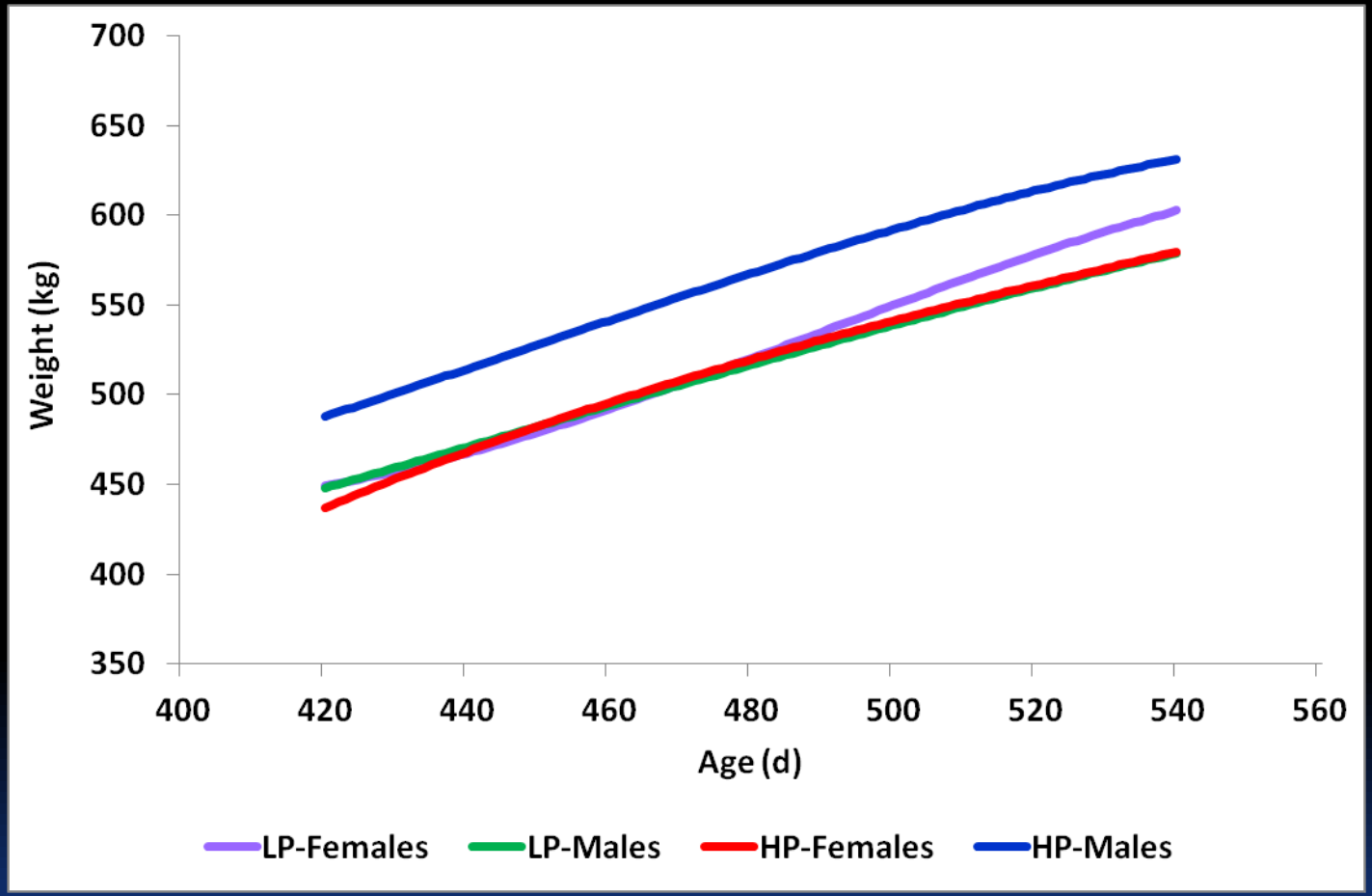
GROWTH CURVES - FIRST PERIOD



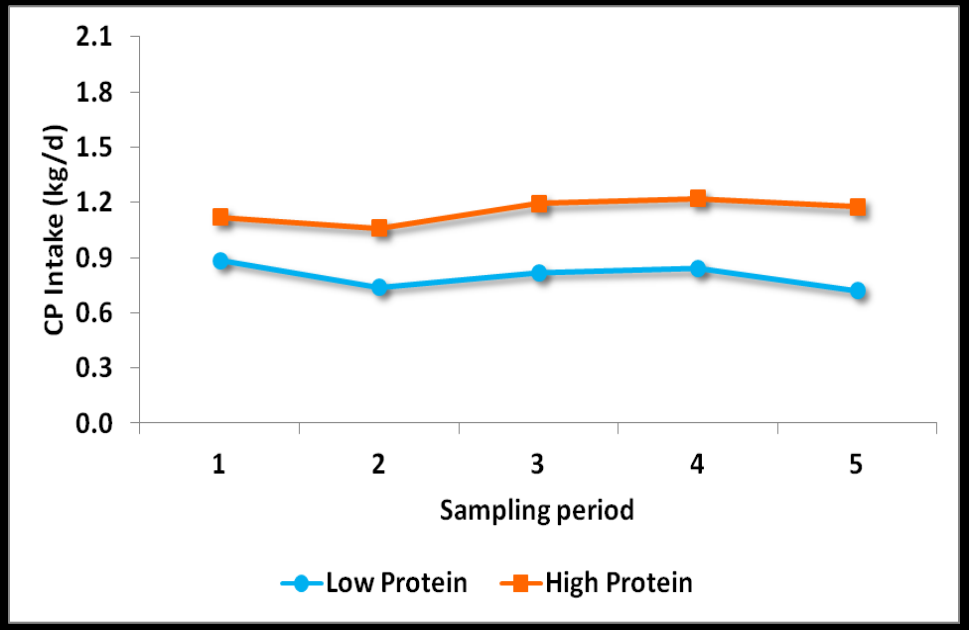
GROWTH CURVES - SECOND PERIOD



GROWTH CURVES - SECOND PERIOD

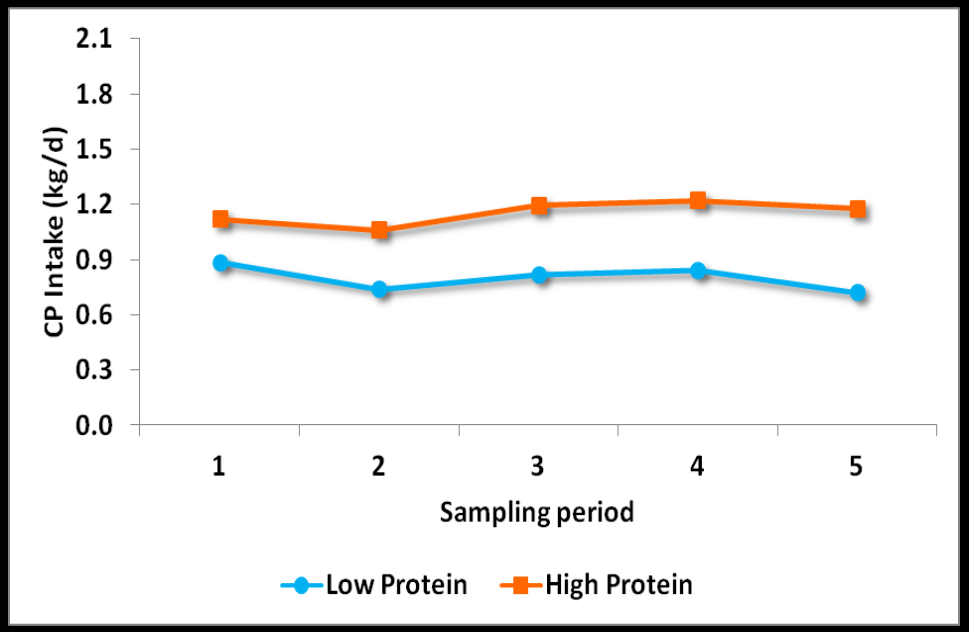


PROTEIN INTAKES



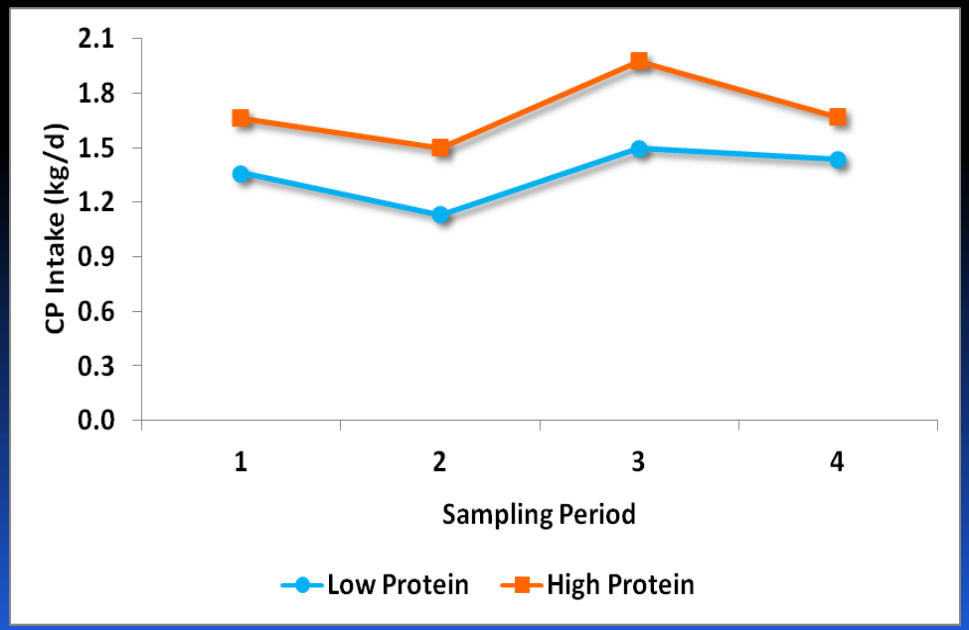
first period
0.8 vs. 1.2 kg/d

PROTEIN INTAKES

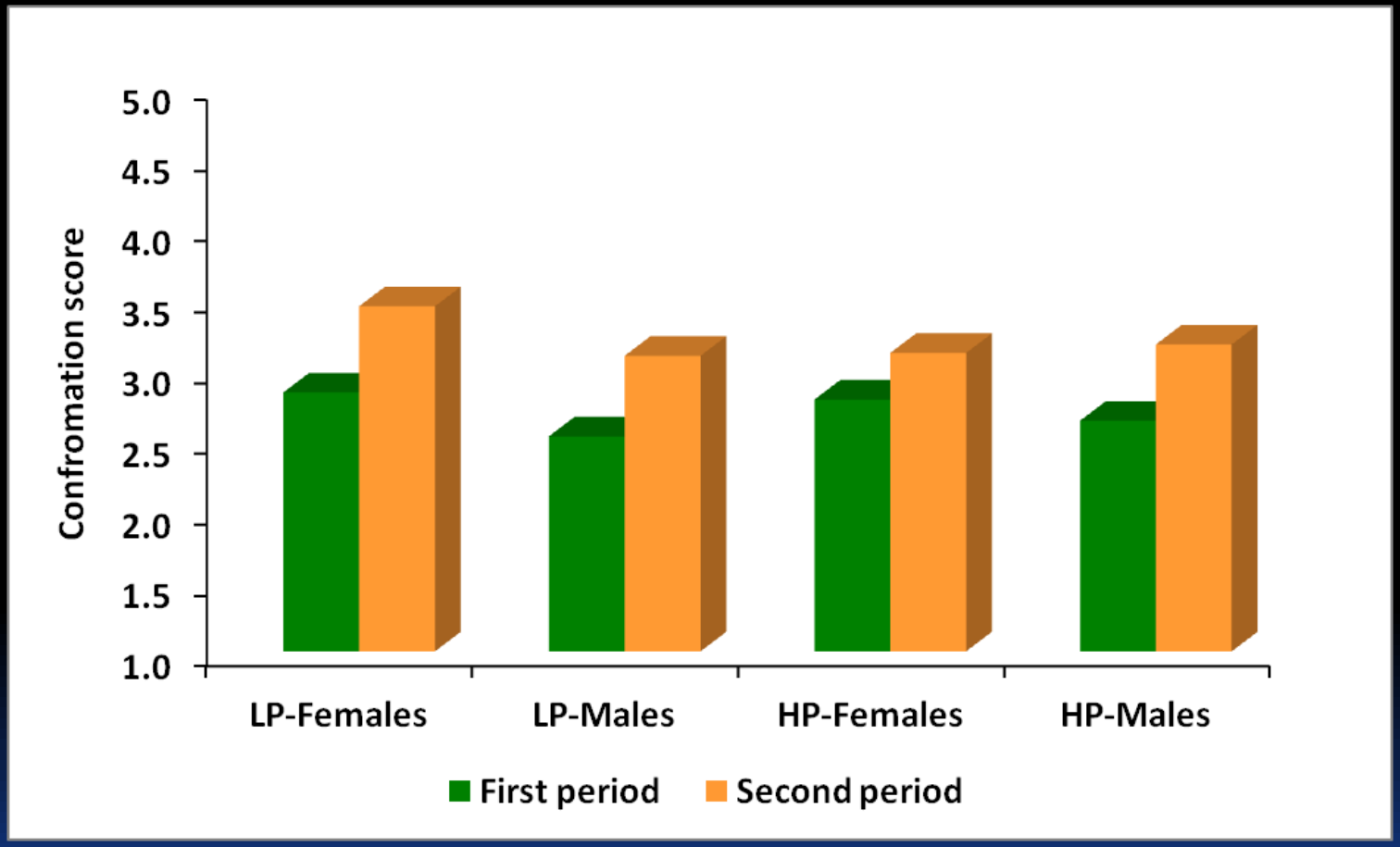


first period
0.8 vs. 1.2 kg/d

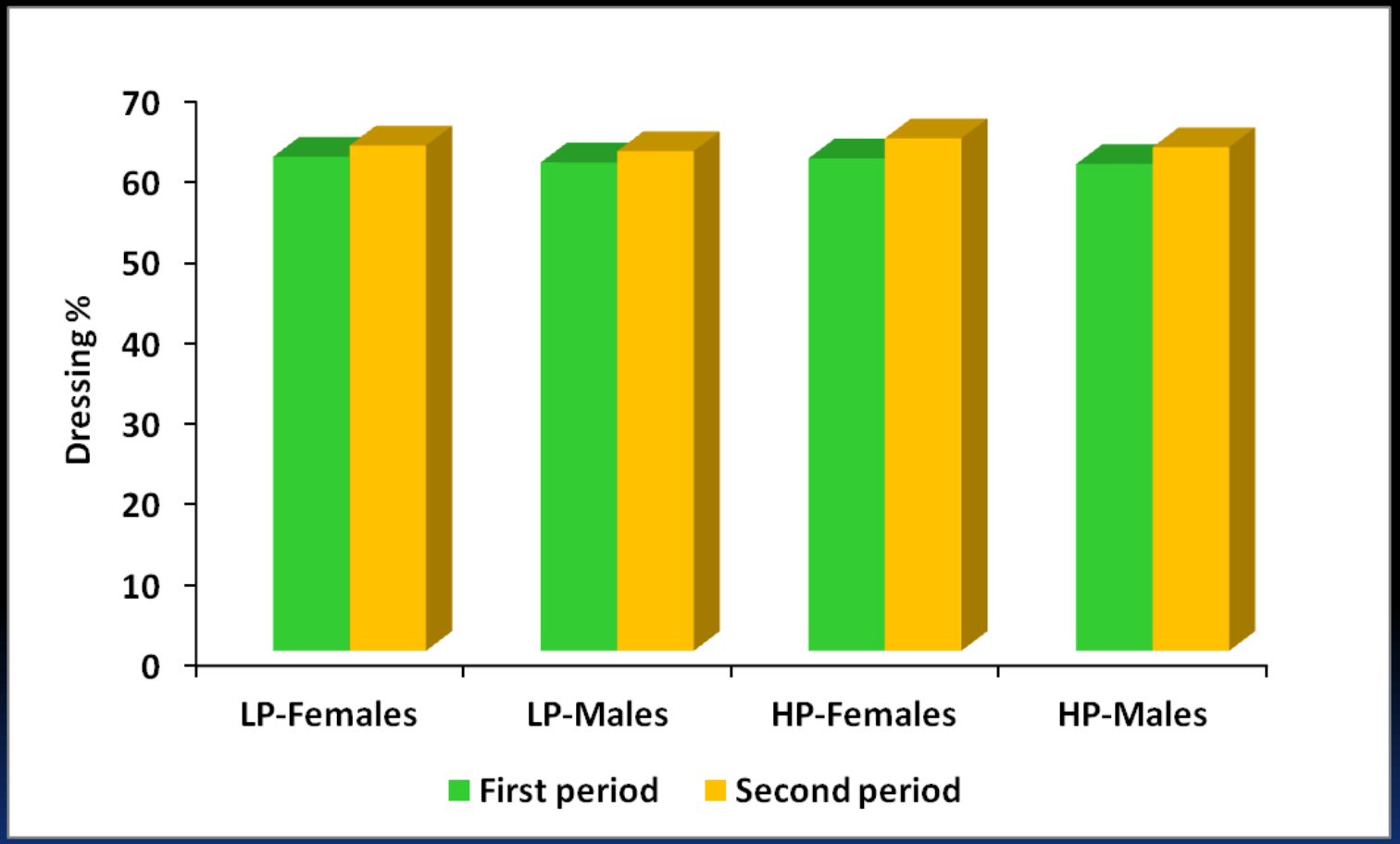
second period
1.3 vs. 1.7 kg/d



SLAUGHTER DATA: CONFORMATION SCORE



SLAUGHTER DATA: DRESSING PERCENTAGE



CONCLUSIONS

- A dietary protein restriction (i.e., on average 3% of DM) in IHDH foals did not affect growth of animals up to 13 or to 18 months of age
- Even at slaughter no different dressing percentage or conformation were appreciable
- Animals fed low dietary CP had probably a better efficiency in N utilization
- The reduction in protein supply can be of benefit for reducing the costs of diet, with also possible positive effects on N pollution

ACKNOWLEDGMENT

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DGR 877 del 07/04/2009 - misura 124
Progetto LABELCAI

THANK YOU FOR YOUR ATTENTION