Effects of added spray-dried whole colostrum and spray-dried plasma on veal calf health and performance. D. Wood, J. Sowinski, R. Blome; Animix, Juneau, WI

Introduction

• Research shows that spray dried plasma reduces mortality (Nollet et al, 1999) and improves ADG (Quigley et al, 2000) when young milk-fed calves are challenged with virulent strains of E.coli.

• Further research examining plasma use in calf milk replacers notes reduced scour days, improved grain intake and reduced mortality (Quigley et al, 2003). Data also shows reduced antibiotic use, reduced mortality and fewer incidence of scours (Quigley et al 2002).

• Calves fed 70 g/d of colostrum powder for 14 days experienced less diarrhea, fewer antimicrobial treatments and improved 28 d ADG (Berge et al, 2003). Data also shows reduced antibiotic use, reduced mortality and fewer incidence of scours (Quigley et al, 2009).

• The benefits to calf health and growth from proper colostrum management are clearly recognized. Data also shows that calves that absorb 100 grams of colostrum secrete one to four grams of IgG via colostrum (Besser et al, 1988).

Objectives

To compare the effects of supplementing spray dried colostrum or additional spray dried plasma on health and growth of sale born sourced Holstein calves that are already consuming a milk replacer that contains 5.2% plasma to 57 days age and in an otherwise plasma-void veal finisher (d 58—140).

Material and Methods

Sale barn-sourced Holstein bull calves (n=128; initial BW=42.3 kg; ~1 week of age) were randomly assigned to receive one of three treatments; 1) calf milk replacer + whole spray dried colostrum (Imu-Tek, Colorado) (COL n=42), or 2) same milk replacer + a blend of 70% bovine plasma (APC, Ankeny, IA) and encapsulated fat designed to provide same IgG content as colostrum (PLAS n=42) or 3) same milk replacer + blend of whey protein concentrate and encapsulated fat designed to be iso-nutritious to colostrum (CONT n=44). Treatment pairs were equally placed within each row, i.e. calves in stalls 1 & 2 were supplemented CONT, calves in stalls 3 & 4 were fed PLAS and calves in stalls 5 & 6 were fed COL. Respective supplement was hand added to feed bowls each feeding, CONT and COL were 44.3% CP and 18.1% fat, PLAS was 57.3% CP and 18.1% fat. PLAS-fed calves received +200 grams more CP than COL or CONT in grow-out. COL supplement was 13% IgG and PLAS was estimated 13% IgG. Calves were placed commencing 8/29/2012 over 4 days in a mechanically ventilated, commercial veal production facility in OH with individual stalls to ten weeks age and then housed in pairs to slaughter (1/16/2013). Serum total protein averaged 5.03 g/dL (76.6% < 5.5 g/dL) and there was no difference between groups.

All calves were fed liquid milk replacer (all milk, 17% CP, 19% fat) with bovine plasma mixed into the formula on-farm at 5.2% of total solids fed until day 57. Plasma was transitioned over 6 days and then calves received the all-milk 17:19 until finish (day 140). Calves were individually supplemented 25 grams (g) / feeding (2X/day) of respective supplement week 1, then 15 g/feeding week 2, 10 g weeks 3-5, 5 g week 6-7 and 2.5 g weeks 8-20. Accounting for total solids intake, calves started on a 25:18 (CP:fat), increased to 871 g/day of (21:18 by 21 d and 1,742 g/d 20:18 by 53 d. Each calf received 1.54 kg of respective supplement (1.14 kg in first 53 d). Milk replacer was medicated to 21d. No grain or forage was fed at any time.

Results & Conclusion

Calves fed additional plasma (PLAS) outgained (P<0.05) CONT by +2.52 kg d1—53. Supplementing spray dried colostrum (COL) was intermediary (+1.23 kg). Placement weight (42.3 kg) was doubled at 53 days age on a milk replacer solids intake of 37.5 kg. In the finisher phase (d 58—140) COL tended (P=0.077) to outgain CONT by +8.57 kg. PLAS was intermediary (+2.78 kg vs CONT). COL fed calves tended to have reduced antibiotic use, reduced mortality (P=0.076, 1.15 vs. 1.98 kgd) compared to CONT. PLAS was intermediary (1.12 kg/day). There was no difference in gain between COL and PLAS at any weight measure. Incidences of either partial or complete milk replacer refusals in the finisher phase were reduced when calves were supplemented additional plasma (P=0.048) or colostrum (P<0.027). During peak scour period (room fill & week 1), PLAS and COL noted a 30% and 46% reduction, respectively, in number of calves treated (NSD). Individual calf treatments per calf placed were $2.28, $4.06 and $5.82 for COL, PLAS and CONT respectively. There was a trend (P=0.08) for fewer calves treated at least 1x start to finish when supplemented COL vs. PLAS and total number of calves treated 1x was 38%, 57% and 52% for COL, PLAS and CONT, respectively. There was one mortality in the study (PLAS).

• Supplementing extra plasma significantly increased (P<0.05) body weight gain day 1—53.

• Supplementing just 5 grams of colostrum daily in an all-milk finisher (day 54—140) milk replacer tended (P<0.077) to increase ADG.

• Incidences of partial or complete milk replacer refusals were reduced in finisher phase with addition of just 5 g / day of either plasma or colostrum.

• Total 140 d gain: +5.3 and +9.8 kg for PLA and COL vs. CONT, respectively.

Incidence of individual medical treatments, mortality and milk refusals were recorded. Individual scale weights were measured at placement and 53 days. Individual hanging carcass weights were recorded and live weight was estimated using 58.5% D.P. .

Subscripts different P<0.05

Kilogram Gain day 1 - 53

Subscripts different P<0.05

Litter average milk replacer (all milk, 17% CP, 19% fat) with bovine plasma mixed into the formula on-farm at 5.2% of total solids fed until day 57. Plasma was transitioned over 6 days and then calves received the all-milk 17:19 until finish (day 140). Calves were individually supplemented 25 grams (g) / feeding (2X/day) of respective supplement week 1, then 15 g/feeding week 2, 10 g weeks 3-5, 5 g week 6-7 and 2.5 g weeks 8-20. Accounting for total solids intake, calves started on a 25:18 (CP:fat), in-