

Twenty-two calf studies reported in 20 journal articles (2 reported multiple studies) examining plasma proteins added to milk or milk replacer have been published, 18 reported ADG and of these, 4 showed significant ( $P \leq 0.05$ ) improvement (Grice 2020, Kehoe 2015, Quigley 2000, Morrill 1995), 11 no difference (Henrichs 2021, Wood 2019, Raeth 2016, Pineda 2016, Quigley 2006, Quigley 2003, Quigley 2002, Arthington 2002, Quigley 1996, Jones 2004), and 2 showed a reduction (Vasquez 2017, Morrison 2017), and in one of these two studies, plasma only reduced ADG when replacing 66% and 100% of the whey-based protein in the formula, when replacing 33% of whey-based protein, performance was comparable (Vasquez 2017). Fifteen reported starter grain intake and 5 showed an increase ( $P \leq 0.05$ ) when plasma was in the milk replacer (Grice 2020, Pineda 2016, Quigley 2003, Arthington 2002, Morrill 1995) while 10 showed no difference. Eighteen reported incidence of diarrhea and 10 reported reductions ( $P \leq 0.05$ ) in incidence or severity (Wood 2019, Vasquez 2017, Morrison, Pineda, Raeth, Kehoe, Quigley 2003, Quigley 2002, Hunt 2002, Nollet 1999), the balance reported no difference. Four (Pineda, Quigley 2003, Quigley 2002, Nollet) reported reduction ( $P \leq 0.05$ ) in mortality and 3 a reduction ( $P \leq 0.05$ ) in use of medications (Pineda, Morrison, Quigley 2002). Comparable (NSD) or improved ( $P \leq 0.05$ ) health or growth was achieved when plasma was incorporated at 3.3% (Quigley 2000), 5% (Henrichs 2021, Wood 2019, Morrison, Quigley 2003, Quigley 2002), 6.33% (Quigley 1996, Grice), 6.66% (Vasquez), 7% (Raeth), 7.5% (Henrichs), 7.7% (Morrill 1995, Raeth), and 10% (with added amino acids in both studies - Henrichs 2021, Morrison 2017). SDBP is typically priced similarly to WPC per unit of protein.

### **Citations for published papers on feeding plasma in CMR's:**

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Henrichs BS, Brost KN, Hayes CA, Campbell JM, Drackley JK, et al. Effects of spray-dried bovine plasma protein in milk replacers fed at a high plane of nutrition on performance, intestinal permeability, and morbidity of Holstein calves. *J Dairy Sci* 2021. 104:7856-7870. <https://doi.org/10.3168/jds.2020-20104>

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**Citations for non-published abstracts presented at ADSA regarding feeding plasma proteins in CMR's**

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Fringer M, Campbell JM, Williamson S, Thompson KS. Evaluation of Lifeline Protect at arrival and NutraPro formulated into a traditional milk program under California feeding and housing conditions during the winter season on calf growth, morbidity, and mortality. J Dairy Sci 2020; 103, E-Suppl. 1, 19. Abstract 50.

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