



#ColostrumIsGold Science and Facts

About colostrum

- Provides antibodies that form the main parts of an acquired immune system. This can reduce or prevent the need for antibiotic treatments in the new-born or older animal.
- The new-born animal has little body fat, which means it is highly dependent on the fats and carbohydrates in colostrum as a source of energy to maintain body temperature and growth. Insufficient energy supply at birth can lead to hypothermia.
- Colostrum provides other nutrients, including: vitamins A, D and E which help increase the absorptive and digestive capacity of the digestive system; enzymes and proteins which suppress growth of certain bacteria and contribute to the immune system¹.

Feeding guidelines

Calves: Feed high quality (>50 mg/ml of antibody) colostrum at 10% of body weight ideally within 2 hours of birth but definitely within 4.

Lambs: Rule of thumb is 210–290 ml/kg body weight in the first 24 hours of life to give essential levels of natural immunity. But importantly, the first feed should be within 2 hours of birth.

Pigs: New-born pigs should suckle within 30 minutes of birth to meet energy requirements, and consume over 200ml of colostrum in total in the first 24 hours.

Sheep facts

- Lambs fed adequate quality colostrum at birth do not succumb to Watery Mouth²
- A large number of lambs born in the UK currently receive oral antibiotics as protection:
 - Oral antibiotics were prescribed to 49% of flocks covering approximately 64% of predicted lamb crop (NB: a very small % of total antibiotic usage on sheep farms)³
 - A veterinary student survey on farms of housed sheep at lambing time suggested 68% of sheep farms used prophylactic oral antibiotics in neonatal lambs⁴
 - A questionnaire survey of sheep farmers supplying lambs deadweight suggested that 26% of farms gave prophylactic oral antibiotic to all neonatal lambs born on their farm⁵
- There is no significant difference in the productivity levels between flocks using prophylactic antibiotic for neonatal lambs and those that used none⁵
- 50% of neonatal lamb *E coli* are resistant to spectinomycin (most common Watery Mouth treatment)⁶

Pigs facts

- Higher colostrum intake (200ml) improves the survival rate up to weaning⁷
- Colostrum intake above 290ml per pig at birth has led to 6-week weights being 2kg heavier⁸
- The smaller the interval between birth and first suckle, the lower the levels of pre-weaning mortality⁸

¹ Patel, S. Gibbons J. and Wathes, D.C. (2014) Ensuring optimal colostrum transfer to new-born dairy calves. Cattle Practice Vol 22 Pt 1

² Lovatt, F., Duncan, J. and Hinde, D. (2019) Responsible Use of Antibiotics on Sheep Farms. In Practice Vol 41–1

³ Davies, P., Remnant, J.G., Green, M.J., Gascoigne, E., Gibbon, N., Hyde, R., Porteous, J.R., Schubert, K., Lovatt, F. and Corbishley, A. (2017) Quantitative analysis of antibiotic usage in British sheep flocks Veterinary Record 181, 511

⁴ Douglas, F., and Sargison, N.D. (2018) Husbandry procedures at the point of lambing with reference to perinatal lamb mortality. Veterinary Record vol. 182, no. 2, p. 52

⁵ Lima, E., Lovatt, F., Davies, P. and Kaler, J. (in press). Using abattoir sales data to investigate associations between implementations of disease preventative practices and sheep flock performance

⁶ VARSS 2016. (2017). Veterinary Medicines Directorate

⁷ Moreira, L.P., Menegat M.B., Barros, G.P., Bernardi, M.L., Wentz, I., and Bortolozzo, F.P. (2017) Effects of colostrum, and protein and energy supplementation on survival and performance of low-birth-weight piglets. Livest. Sci. 202, 188–193

⁸ Devillers N., Le Dividich, J. and Prunier, A. (2011). Influence of colostrum intake on piglet survival and immunity. Animal Aug;5(10):1605-12

Cattle facts

- Over 30% of dairy farmers now test the quality of the colostrum before feeding it but just 5% of dairy farmers are feeding colostrum in the first 2 hours of birth, the ideal timeframe⁹
- It is estimated that almost of third of pre-weaning calf deaths occurring in the first 3 weeks of life can be attributed to failure of passive transfer¹⁰
- Up to 50 percent of calves do not receive enough colostrum and only 30 percent have sufficient levels of colostral immunity¹¹
- A calf needs to suck continuously for approximately 20 minutes to consume enough colostrum from the cow¹²; 46% of calves born to second parity or older cows and 11% of calves born to first-calf heifers failed to suckle within 6 hours after birth¹³
- Calves with low antibody levels are more likely to become ill and more likely to die before weaning. Conversely, higher concentrations at 1-2 days of age are linked to better health, lower mortality and higher daily liveweight gain, with animals reaching target weights more quickly:
 - Calves with low antibody levels were 1.6x more likely to become ill and 2.7x more likely to die before weaning. Higher antibody concentrations were linked to better health, lower mortality and higher liveweight gain; at 205 days, calves were on average 3.5kg heavier¹⁴
 - Calves with high antibody levels from colostrum reached target first service weights sooner¹⁵
 - Antibody concentration in the calf at 1-2 days old significantly affected average daily weight gain through to 6 months of age¹⁶
 - Calves fed sufficient colostrum quickly enough more than halved their risk of pneumonia¹⁷
 - Brown Swiss heifer calves given 2 or 4 litres of colostrum at birth were monitored for two lactations after calving. Those given 4 litres showed a 30% increase in pre-pubertal growth rate, a 16% increase in survival to the end of the second lactation and 1,026kg more milk production over those given 2 litres¹⁸
 - Antibodies from colostrum helped protect calves from death and poor performance from septicaemia and pneumonia, with effects lasting up to 6 months of age¹⁹
 - Calves with good colostrum status were a third less likely to die and half as likely to experience illness²⁰

Colostrum status (ZST units)	Low (0-10)	Marginal (10-20)	Good (>20)
% of calves	18	32	50
Mortality %	9.8	4.1	3.2
Illness %	31.6	23.0	15.1
Pneumonia %	5.2	3.2	1.4

(ZST = Zinc Sulphate Turbidity)

Blowey, R.W. (1999)²⁰

More information, resources and tweets from www.ColostrumIsGold.org

⁹ Boulton, A.C et al. (2015) A Study of Dairy Heifer Rearing Practices from Birth to Weaning and Their Associated Costs on UK Dairy Farms. Open Journal of Animal Sciences

¹⁰ Wells S.J., Dargatz D.A., Ott S.L. (1996) Factors associated with mortality to 21 days of life in dairy heifers in the United States. Prev Vet Med 29:9–19

¹¹ All Island Animal Disease Surveillance Report 2012. (2016) AFBI/DAFM Veterinary Laboratories

¹² MSD Animal Health Hub: Colostrum <https://www.msd-animal-health-hub.co.uk/DNOMF/Colostrum>

¹³ Edwards, S.A. and Broom, D.M. (1979). The period between birth & first suckling in dairy calves. Res Vet Sci 26:255–6

¹⁴ Dewell, R. D., Hungerford, L. L., Keen, J. E., Laegreid, W.W., Griffin, D.D., Rupp, G.P. and Grotelueschen, D.M. (2006). Association of neonatal serum immunoglobulin G1 concentration with health and performance in beef calves. J. Am. Vet. Med. Assoc. 228:914–921

¹⁵ Furman-Fratczak, K., Rzasa, A., and Stefaniak, T. (2011) The influence of colostral immunoglobulin concentration in heifer calves' serum on their health and growth. J. Dairy Sci. 94:5536–5543

¹⁶ Robison, J.D., Stott, G.H. and DeNise, S.K. (1988). Effects of passive immunity on growth and survival in the dairy heifer. J. Dairy Sci. 71:1283–1287. [https://doi.org/10.3168/jds.S0022-302\(88\)79684-8](https://doi.org/10.3168/jds.S0022-302(88)79684-8)

¹⁷ Virtala, A.M., Gröhn Y.T. and Mechor G.D. (1999) The effect of maternally derived immunoglobulin G on the risk of respiratory disease in heifers during the first 3 months of life. Preventative Veterinary Medicine 39

¹⁸ Faber, S.N., Faber, N.E., McCauley, T.C. and Ax, R.L.(2005). Case Study: Effects of colostrum ingestion on lactational performance. Prof. Anim. Scientist 21:420-425

¹⁹ Donovan, D.A., Dohoo, I.R., Montgomery and D.M., Bennett, F.L., (1997). Associations between passive immunity and morbidity and mortality in dairy heifers in Florida, USA. Preventative Veterinary Medicine 34 (1998) 31-46

²⁰ Blowey, R.W., (1986). A Veterinary Book for Dairy Farmers. Farming Press Ltd