

Quality of milk replacers for nutrition of calves, lambs and kids produced in Serbia

Radisav J. Tomović, Tatjana A. Milićević, Jelena V. Banjac, Bankom, The Oils and Proteins factory, Belgrade; Milan J. Adamović Institute For Technology of Nuclear and Other Raw Materials, Belgrade

Due to economic reasons worldwide and more recently in our country, milk replacers are being used as an alternative to milk for the nutrition of calves, lambs and kids. The use of milk replacers for calves saves 250-300 litres of cows milk, whilst 50-60 litres of sheep and goat milk for lambs and kids is saved respectively. Nutrients which are used for the production of milk replacers must contain high quality biological protein, have good digestibility and solubility in water, as well as a good taste and be of outstanding hygienic standard. The quality of production has to be the main criterium in the choosing of milk replacers.

The highest quality milk replacers are those which are produced as skimmed or full fat milk powder and whey. Quality sources of protein in milk replacers (up to 50% protein) can come from herbal sources of protein, products based on thermally skimmed and peeled soybeans (full fat, partially or completely fat-reduced flour, concentrated and isolated soya protein), isolated protein of peas, potatoes and wheat. From animal sources, concentrated and isolated fish protein is used.

In smaller quantities it is possible to use yeast and other high quality products which the modern feeding industry offers. The optimum contents of protein in milk replacers for calves, lambs and kids is from 22-24%.

In milk replacers, fats are added as sources of energy. Fat of animal origin today is in pig fat and fish oil. From herbal fats are oils of soya, sunflower, corn, rapeseed, palms, coconuts and flax. 14-18% of fat is most often added in milk replacers for calves, whereas for lambs and kids it is 18-24%. The largest value of these is added for intensive fattening. Replacers containing a variety of fat sources, including more essential, polyunsaturated omega fat acids (lino, linolen, ararin), are considered to be better. The adding of fats to milk replacers improves the synergy between energy and proteins and heightens their energetic value which results in greater upgrowth and creation of bodily fat reserves.

Regular contents in milk replacers are also minerals, vitamins, emulgators, antioxidants, but on the recommendation of the producers or the wishes of the buyer, it is possible to include other additives.

During use of quality milk replacers in combination with primary mixtures (18-20% collective proteins) & hay lucerne, above 500 grams of daily growth for calves is created, or 180 grams for lambs and kids. Young animals begin to consume dry foods sooner. Their digestive tracts develop more intensively and are hence more successfully involved in the process of reproduction and fattening.

Imported milk replacers of variety of qualities and prices can increasingly be found on the market in Serbia. Starting from 2005, milk replacers for calves, lambs and kids in Serbia have been produced by the oil and protein factory "Bioprotein" in Obrenovac, under the Bankom Group in Belgrade. These replacers are produced of high quality raw materials, mainly domestic and genetically unmodified, using modern equipment which allows the production of hygienically correct food of the highest quality.

In production of milk replacers the factory uses milk powder, whey powder, full-fat thermally skimmed flour of peeled soybeans, isolated soya protein, yeast, fat and oil, dextrose, emulgators, decalcium phosphate, calcium carbonate, nitrium chloride, trace elements, vitamins, antioxidants (BHT), aminoacids, enzymes, microencapsulated milk acids, bacteria, organic acids, adsorbent mycotoxins and aromas. Tables 1 and 2 give a glance at the the chemical contents and microbiological validity of replacers.



Table 1. Chemical contents of milk replacers

Parameter	Calves	Lambs and kids
Humidity, %	4,82	4,97
Proteins, %	24,34	24,42
Fat, %	16,30	23,40
Fibre,%	0,63	0,67
Ash,%	7,41	6,89

Table 2 .Microbiological validity of milk replacers

Kind of microorganism	Quantity	Referent value
Bacterias (in 1 gr)	< 50.000	50.000.000
Mildew (in 1 gr)	0	10.000
Salmonella (in 50 gr)	0	0
Pathogenic microorganisms (in 50 gr)	0	0
Sulfite-reducing clostridia (u 1 g)	0	1.000

Biological experiments on kids take place on a goat farm at the company Selekt-Gas in Indjija. The results of the use of milk replacers in the diets of calves and kids are shown in table 3.

Table 3.Weight and upgrowth od calves and lambs, kg

Indicator	Kids
Weight at day of birth	3,40
Weight, 60 days old	18,50
Daily upgrowth, until day 60	0,252

It is concluded that with the use of modern apparatus and quality domestic raw materials, along with respected new nutritional advice, it is possible to produce high quality milk replacers in Serbia. Usage in accordance with adequate technology can give good results. At that, large costs in the feeding of offspring are saved as opposed to the conventional way i.e. less than 20 - 30%.