

Milk Replacer Update: April 2010

As many wildlife rehabilitators are busy caring for juvenile wild mammals, they are also seeking current information about formulas due to recent changes in milk replacer powders used with juvenile wild mammals. This update describes some of those recent changes as well as resources about the products. As much as everyone wishes there were easy, simple and straightforward solutions, rehabilitators will find that there are challenges with various products. Rehabilitators are encouraged to keep analyzing the products, their practices, and the results -- and to share that information with each other.

Tests on more milk replacer powders

WildAgain has had proximate analysis, mineral content and peroxide value tests conducted by an independent lab and WildAgain's solubility and weight tests on several milk replacers fed to wildlife, including PetAg®, Fox Valley®, Just Born® and 21st Century® products. *Recent analyses suggest that mineral levels may be one of the key factors in understanding the product differences and results.*



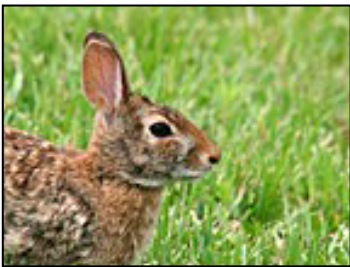
Mineral analyses of various milk replacers are being compared to information in the *Nutrient Requirements of Laboratory Animals, 4th Edition* (1995) as prepared by the National Research Council. While the required amount of minerals is likely different for other species, the levels listed for rats may be considered a general target range for other rodents, including squirrels. The analyses show that some of the milk replacer powders meet the minimum target range for laboratory rats as published in the *Nutrient Requirements of Laboratory Animals*. Some of the products have low levels of some nutrients, such as copper or manganese; others have higher levels, such as sodium, when compared to the target nutrient levels for laboratory rats.

The individual test results and summaries are posted to facilitate analysis and decisions about product use with wild mammals (<http://www.ewildagain.org/Milk%20Replacers/Powdered%20milk%20replacer%20tests.htm>).

It should be noted that it is difficult for a customer to adjust the extremely tiny amounts of trace minerals in a milk replacer. Adding too much of any nutrient may cause toxicity, e.g., excess copper could result in liver and kidney damage, and more. As such, it is desirable for a product to contain the appropriate concentrations and balance of the required dietary macro-minerals and trace elements. The methods, effectiveness and safety of adding various vitamin and mineral supplements are being reviewed.

Esbilac® powder ingredient change

In early spring 2010, rehabilitators began to notice labels from Esbilac® powder made after August 2009 listed different ingredients than recent years. For example, a label of the Esbilac® powder made in December 2009 and another from 2010 did not list several previous ingredients (e.g., egg yolk, whey protein concentrate). Those labels also listed several new ingredients, including taurine, an amino acid considered important for the young of many species. PetAg has recently acknowledged to several callers that those ingredients in Esbilac® powder had changed concurrent with the manufacturing change in December 2008.



This information differed from what rehabilitators were told in mid-2009 when they specifically asked PetAg if any ingredients had changed. The PetAg staff, including the nutritionist, emphasized that the manufacturing process had changed but the ingredients and recipe had remained exactly the same.

Some rehabilitators feeding formula made with Esbilac® powder produced since December 2008 to juvenile wildlife continue to report positive gastrointestinal health and excellent growth when they prepare it with hotter water and allow the mixed formula to 'rest' in the refrigerator at least 4 hours. Other rehabilitators who modified their formula preparation practices, even

PetAg has emphasized that Esbilac® was developed to meet the nutritional needs of puppies. They said puppies fed formula made with Esbilac® powder have done well and no problems have been reported. KMR® was developed for kittens.

PetAg says that feeding Esbilac® and KMR® to wild mammals is an off-label use.

including feeding probiotics twice a day, report that some juvenile wild mammals are growing well but develop soft stool or diarrhea, often with an offensive odor.

Proximate and mineral analyses conducted on various lots of Esbilac® powder made since 2008 by a certified independent lab have shown that the composition of protein and fats met the guaranteed requirements. However, weights, composition, energy, compaction, texture and more varied for those same lots. Such variability could be caused by a change in ingredients, adjustments to the new processing method, and more.

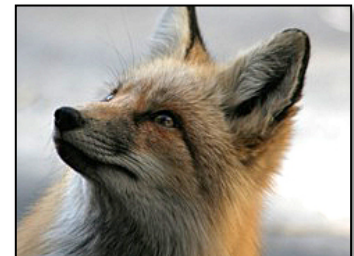
While some rehabilitators are satisfied with the Esbilac® powder and results, others express frustration with the unpredictability of the weights, kcals, composition, and, recently, ingredients of the various lots of Esbilac® powder, and uncertainty about how to adjust each lot for wild mammals. Some rehabilitators have switched to using other milk replacers due to the gastrointestinal difficulties in the juvenile wild mammals and variability of the Esbilac® powder.

Fox Valley® Day One® 32/40 and 20/50

Some rehabilitators report that they are very pleased to see juvenile rabbits, opossums, squirrels and raccoons have normal stool, health and growth rates when fed formula made with Fox Valley's Day One® 32/40. Other rehabilitators believed that while the squirrels fed Fox Valley's 32/40 and 20/50 had healthy stools, the growth rates were slower, body mass less substantial, and lower activity levels than they had seen with squirrels fed formula made with Esbilac® powder in previous years.

Testing of two lots of Fox Valley Nutrition 32/40 and one lot of 20/50 confirmed that the composition and nutrients were as stated on the label. The 20% protein level of Fox Valley 20/50 is intended to meet the needs of some species with lower protein needs, such as opossums. However, the 20% protein in 20/50 is less than other species need, such as squirrels. It should be remembered that the percentages of protein and fat on the labels refer to dry powder, i.e., 20% protein and 50% fat and are much lower when mixed with water to produce the formula. More information on comparing dry powder and 'as fed' formula is available at http://www.ewildagain.org/Milk%20Replacers/dry_vs_wet_matter_basis.htm. (Milk composition of common wild mammals in North America is available in the *NWRA Principles of Wildlife Rehabilitation, 2nd Edition* at www.nrawildlife.org)

The average level of copper in three lots of Fox Valley that were tested was 28% of the minimum dietary copper when compared for laboratory rats (*Nutrient Requirements of Laboratory Animals* - 1995). Copper deficiencies may affect growth, bone development and strength, activity level, and more (*Wildlife Nutrition and Feeding, 2nd Ed.*, Robbins). Nick Vlamis, president of Fox Valley® Nutrition, told WildAgain that he includes copper in his 32/40 and 20/50, but will review the copper levels.



Some wildlife rehabilitators concerned with the lower copper levels in Fox Valley 32/40 have mixed that formula and combined it with an equal part of mixed Esbilac formula (lot 3419E) and reported positive results after feeding it to 40+ squirrels for four weeks. Other rehabilitators have tried similar 'combinations' with Fox Valley 32/40 with other milk replacers and report initial positive results. However, more cases and results over a longer period of time are needed before conclusions may be drawn.

Solubility benefits from mixing adjustments

Comparison solubility tests conducted by WildAgain on several milk replacer powders commonly fed to juvenile wild mammals confirmed food science information about the improved solubility when using hotter water (e.g., 175°F (and not boiling) and allowing the formula to 'rest' for at least four hours, and preferably 8 hours, before feeding. Rehabilitators report juvenile young mammals have been growing at a better and more consistent rate when rehabilitators prepared formula according to these modifications. Plus, the rehabilitators say that it has been convenient to mix the formula once a day rather than just before each feeding. More information on solubility and mixing are available at http://www.ewildagain.org/Nutrition/mammal_nutrition_resources.htm.

Milk replacer powder stability

WildAgain arranged for a certified independent laboratory to conduct Peroxide Value (PV) tests to assess potential rancidity on various milk replacer powders, including several different lots of both Esbilac® and KMR®

powders. Most of the cans of milk replacer powder tested by the certified independent lab did not show spoilage.

The PV tests revealed that a can of Esbilac® powder lot1639E and lot 0759E showed elevated PV levels shortly after opening. While PetAg had stated that the single-step spray-dry process was intended to help improve product stability, two cans were from Esbilac® lots produced in 2009. A PV test also confirmed a can of KMR® powder lot K1469K to have an elevated PV level. Since then, wildlife rehabilitators and others have found and reported some cans of Esbilac® and KMR® powder from other lots that also had 'off odors'.

PetAg placed a statement on its website that while the milk replacer powders met standards when leaving PetAg, a small number of packages had been reported spoiled during transit, presumably after exposure to excessive heat. Information was posted on Petag.com about susceptibility of milk powders to spoilage, especially those without preservatives. Effective storage of KMR® and Esbilac® powders was emphasized. PetAg.com provides tips to identify signs of and prevent spoilage. PetAg switched to producing KMR® powder with the single-step spray-dry method in autumn 2009 to help improve its stability.

It should be noted that elevated PV levels may occur in any milk powder produced by any manufacturer, including products with preservatives. Since spoiled food can cause a variety of health problems, wildlife rehabilitators are encouraged to use effective storage practices and closely examine the milk replacer powders as part of their general practice.

Probiotics

Some rehabilitators adding diverse strains of live probiotics to formula twice a day have reported a very positive effect on overall health and growth. Some observed that the brand of probiotic as well as the type and number of bacteria seem to make a major difference. In addition, some rehabilitators reported that they believe very young mammals have much better GI health when an inoculant made from confirmed healthy stool of adult animals of the species is used instead of a commercial probiotic. A few rehabilitators have reported the probiotic *Saccharomyces boulardii* (e.g., Florastor®) has been particularly helpful in some cases of squirrels with yellow-mucousy stools resulting from antibiotics and bacterial overgrowth.

Expanded mammal nutrition resources at www.ewildagain.org

WildAgain has posted extensive mammal nutrition resources, test results on numerous milk replacers, and more that we hope the wildlife rehabilitation community will find useful. We have not posted recipes or product recommendations as it is still early in the research process and results are still being evaluated. We hope that increasing our individual and collective understanding of and experience with products and recipes, and sharing information on these *and the results* will lead to more effective rehabilitation practices and fewer health problems with wildlife than the rehabilitation community has encountered in the last few years. Updates will continue to be posted on www.ewildagain.org.

Authors

Allan and Shirley Casey, co-founders of WildAgain Wildlife Rehabilitation, Inc. in Evergreen, Colorado, have been licensed rehabilitators since 1986. The Casey's conduct research on a variety of rehabilitation related subjects, including nutrition, wildlife health, rehabilitation regulations, and trends. They have written over 100 articles for rehabilitation and veterinary publications, as well as the *Squirrel Rehabilitation Handbook*. www.ewildagain.org The Caseys have no affiliation with any milk replacer company.

