

‘New’ Esbilac® Powder and Juvenile Wild Mammal Formulas Update September 23, 2009

WildAgain Wildlife Rehabilitation continues to collect information regarding the ‘new’ Esbilac® powder manufactured after December, 2008. As with our other research projects, we try to provide information to the wildlife rehabilitation community that will support rehabilitators and their veterinarians in their decisions and practices.

Key information in this update:

- The ‘new’ Esbilac® weighs less and seems to have inadequate amounts of energy (kcal) and some nutrients required to meet the minimum needs of some juvenile wild mammals.
- Some rehabilitators report seeing positive results using the ‘new’ Esbilac® powder, particularly after adjusting the recipe to increase fats.
- Other rehabilitators share that their juvenile squirrels and opossums are not improving after adding more fats to the formula made with the ‘new’ Esbilac® powder or even switching to a new milk replacement product. Some of these juvenile squirrels and opossums, which stay at an extremely low weight for their age, linger and then die.
- Information on formula recipe changes, deciding on how to adjust formula, and evaluating formula recipes is discussed.
- Cream now is included in the Nutrition Calculator. A short article about selecting cream for formulas is available.
- A draft flow chart on the progression of formula problems and changes, and a chart on possible causes and solutions are offered for reflection.
- An increasing number of rehabilitators and veterinarians are conducting tests on the wildlife that have fallen ill after eating formula made with the ‘new’ Esbilac® powder in hopes of finding answers.

Esbilac® Powder

Reports continue that some rehabilitators are seeing great results when they make formula for the juvenile wild mammals with the ‘new’ Esbilac® powder.

However, even if their animals do not have the diarrhea reported by others, it is important to consider that the ‘new’ Esbilac® powder weighs less than it did in previous years. The information on weights from previous years is available in our update of September 3, 2009. The ‘new’ Esbilac’s weight was provided by PetAg and confirmed by rehabilitators so we could calculate nutrients and kcal. It can be confirmed by weighing the product on a precise and accurate digital gram scale. This reduced weight translates into reduced energy (kcal) and nutrients in the ‘new’ Esbilac® powder when compared to the former Esbilac product.

Adjusting the formula recipe

Juvenile wild mammals have nutritional and dietary needs specific to their species. These needs also can be influenced by various factors, such as age and health. Wildlife rehabilitators who feed young mammals must understand the nutritional needs of the animal based on a milk composition analysis for that species. The commercial milk

replacement products then must be adjusted to reasonably match the milk composition of the mother animal.

Published references on the milk composition analysis of common North American species are available from a variety of sources. The National Wildlife Rehabilitators Association (NWRA), for instance, includes nutrition composition information in their *Principles of Wildlife Rehabilitation, 2nd Edition*. Other publications, such as the *Squirrel Rehabilitation Handbook*, provide nutrition information on specific species, as well as general guidelines about formulas, feeding amounts and number of feedings needed.

Some rehabilitators have increased fats in formulas made with the 'new' Esbilac® powder in order to more closely meet the nutritional needs of the species by adding whipping cream or MultiMilk®. In some cases the diarrhea stopped, the stool normalized and the juvenile mammals began to grow, develop and behave normally (playing, etc.).

Rehabilitators have reported adding whipping cream or MultiMilk® in ¼, 1/3, ½ or 1 part increments depending on species. Some specific health factors that they considered when deciding how much cream or MultiMilk® to add included hydration levels, growth rates, stool composition and ability to digest. The initial effectiveness of the recipe was then assessed through observation (type of stool, amount, hydration, growth and development, etc.).

The fact that some rehabilitators have seen the diarrhea stop after the addition of extra fats may suggest that juvenile wild mammals have a required minimum level or possibly a range of fats and kcals that the 'new' Esbilac® does not now provide when mixed 1:2 or more dilute. For example, the kcals (energy) of the 'new' Esbilac® powder when mixed 1:2 is only .82/cc, compared to .88/cc of the 'old' Esbilac powder from 2007 and .92/cc from 2004. These amounts may seem very close, but still are significant – especially for a small, young, and growing animal. See the update of Sept. 3, 2009 for more specifics on how the kcals and nutrients have changed in Esbilac® over the last five years.

In order to get closer to the amount of nutrients and kcals in the 'old' Esbilac® powder, some squirrel rehabilitators also have slightly increased the amount of 'new' Esbilac® powder to 1.1 or 1.2 parts while continuing to use 2 parts water. Others have tried decreasing the amount of water in the formula to 1.5 parts while keeping the 'new' Esbilac® powder at 1 part. Both the short-term changes, such as stool, hydration, and growth rates, and longer-term factors, such as health, development, growth and survivability still are being monitored and assessed.

Consider how 'recipe' changes affect nutrition and energy

Rehabilitators who plan to change a formula recipe must understand how increasing fats or other ingredients affects an animal's diet. This can be daunting. For example, the published amounts of fat in Eastern Gray squirrel milk ranges from a high of 25% from a

Not a Wildlife Rehabilitator?

There are many requirements to care for orphaned or injured wildlife besides formula. Please take injured or orphaned wildlife to a wildlife rehabilitator. Contact veterinarians, humane societies, or wildlife agencies for the name of a local wildlife rehabilitator.

single study in 1970 to 12-13% from two studies of multiple animals in 1962 and 1972. It is uncertain at what period in lactation the milk was sampled. Squirrel rehabilitators aware of these basic nutritional requirements responded by adding an extra ¼ part to ½ part whipping cream or ¼ part or ½ part MultiMilk® to a formula made with the 'old' Esbilac® powder or Zoologic 33/40 powder in order to increase the fat levels for orphaned juvenile squirrels with their eyes opened. At this age, squirrels need, and are able to digest, the higher levels of fats. Thousands of squirrels of different species thrived on those augmented formulas because they met the animal's nutrition, energy (kcal) and calcium-phosphorus requirements.

It therefore is essential to consider how the nutrition requirements of proteins, fats, solids, energy (kcal) and calcium/phosphorus ratio are met every time that the formula is changed, whether the changes are in amounts or percentages – or even changing the number of feedings or amounts fed. Most rehabilitators, however, are reluctant to perform the complex mathematical calculations required to get these numbers.

The WildAgain Nutritional Calculator makes it easy to do the math and see the affects of dietary changes on paper (note that even if these changes look good on paper, they still need to be evaluated for their affects on the animal's health and growth).

This downloadable Excel-based Calculator has equations for PetAg products, including the 'new' and 'old' Esbilac powders, Zoologic products, MultiMilk® and KMR. Just type in the number of 'parts' of these ingredients and it calculates the fats, solids, calcium/phosphorus and kcal for you. The Nutrition Calculator has been expanded to include not only both the 'new' and 'old' Esbilac, but now also has the ability to use weights instead of just parts and assess several different types of creams. To get even more accuracy, weigh your own products (e.g., 'new' Esbilac, water) and use those instead of the default weights. Take a few minutes to try it out! It can be fun do the calculations this way.

Other milk replacer products will be added to the Calculator when their manufacturers respond to our requests for the necessary nutritional analyses and ingredient lists.

Evaluating formula recipe changes

Measuring and adding different amounts of supplemental ingredients to a milk replacement formula may seem fairly easy. However, knowing exactly how to change a formula and then evaluating the short and long-term results is far more difficult. Small changes can have major affects! For example, while it is a relief to see normal stool in an animal that has suffered diarrhea, rehabilitators also must consider levels of hydration, activity, elimination (stool and urine), appetite, and much more. Rehabilitators must ask if an altered or supplemented milk replacement product fully and optimally supports the animal's health, wellbeing, and ability to survive when released back to live independently in the wild.

It is critical to consider growth rate, development, bone health, teeth, fur/pelage, activity, overall health, ability to live and survive in the wild, and more over a much longer time frame of months or years. It also is essential to monitor and document this with multiple animals and species with preferably different locations and rehabilitators. The results then must be compiled, analyzed, shared and compared with those of previous years, other diets and other rehabilitators. These are things that we all will have to do as

individuals and as a larger rehabilitation community as we seek to change a diet that has been used successfully for many years.

A paper titled, Mammal Nutrition: More than a Cookbook, presented at the NWRA Conference and published in their Conference Proceedings (2001) is available to help with this process.

Selecting a fat to add to the formula

As rehabilitators ask questions about the causes of diarrhea in their juvenile wild mammals, they have reexamined ingredients in the products that make up the formula. One of the things they have learned is that the animal fat in MultiMilk® is not butterfat as many assumed, but rather lard (pork fat). Some rehabilitators plan to continue adding MultiMilk® since it has been used successfully with thousands of animals since 1993. Others, however, now are changing to the addition of a small amount of whipping cream to the formula like some rehabilitators have done for years. A short article about considerations when using cream to enhance wildlife formulas has been posted. More information on types of fats and their impact both on formula and juvenile mammals will be available later.

Chart of case progression

As mentioned, some rehabilitators are sharing positive results with their mammals in care when adding whipping cream or MultiMilk® to formula made with the 'new' Esbilac® powder. Other rehabilitators have continued to observe diarrhea and a variety of other health problems in their juvenile squirrels even after adding whipping cream or MultiMilk® to a formula mixed with 1 or 1.1 parts 'new' Esbilac® powder and 2 parts water. Some have shared that the problems persist even after changing to a different milk replacement formula.

WildAgain has drafted a flow chart of information that has been shared with us concerning the progression of problems in juvenile tree squirrels and opossums when fed the 'new' Esbilac® powder. The chart was developed from many rehabilitator reports of numerous cases across the US this summer. After these rehabilitators first tried to identify and eliminate a variety of causes, they found that the 'new' Esbilac® powder was often the common factor. Still, it is possible that other factors or concurrent conditions may have contributed to, or caused, the observed problems. This draft chart is intended to help wildlife rehabilitators figure out what is happening and where more information is needed. It does not to draw conclusions or make recommendations. [Link](#).

The green boxes on the chart's top are for animals that are healthy and growing when a supplement is added to the formula made with the 'new' Esbilac® powder. The pink boxes below show other possible actions and results.

Note the box in the lower left quadrant of the chart shows that some animals have developed urinary symptoms. Rehabilitators reporting these symptoms say that they first thought wet abdomens were the result of diarrhea, but soon realized that the wetness actually was caused by involuntary urination. It still is unclear if urinary problems are a secondary infection that occurred after, or is due to, the diarrhea or was somehow caused by the formula. The possibility of other factors, such as the Bordatella bacteria that can cause involuntary urination and renal failure in squirrels, also should be

evaluated. These considerations presently are being studied. If you have seen urinary or other symptoms possibly related to using the new Esbilac, or have additional test results, please email them to us at wrehabproject@aol.com.

More reflection on causes and adjustments

Rehabilitators keep asking if the formula made with the 'new' Esbilac® powder can be easily fixed or if they should switch to a different milk replacement product, such as Zoologic 33/40, Goat's Milk Esbilac, Fox Valley Nutrition's formulas. These questions prompted another chart that shows some of the considerations in making that decision. This draft chart is titled "Possible Causes and Actions with Juvenile Wild Mammals when Using Esbilac® Powder made after 12/08".

The chart shows changes, possible issues and potential corrective actions. Boxes in green indicate things that are factual and relatively easy to change. The pink boxes suggest some additional questions and concerns. Like the first chart, this one demonstrates that more research is needed.

Increasing numbers of rehabilitators are having animal blood and urine tested, as well as having culture sensitivities, necropsies and other tests performed. We hope that those results will help us all understand the causes, impacts, and solutions.

Thanks and next steps

Last, **a huge thanks** to rehabilitators, veterinarians and others who have shared information, cases, suggestions, and general support for this team effort to help the wild animals in our collective care.

We continue to gather information and will share it on a regular basis. If you have additional input on symptoms or test results, such as from stool culture sensitivities, blood work or necropsies, we would appreciate your contacting us so that the information may be consolidated, trends analyzed, and data shared. The info can be emailed to us at wrehabproject@aol.com

Resources

- Casey, Allan. 2002. Mammal Nutrition: How Cookbooks Can Be Harmful. Wildlife Rehabilitation, Vol. 19. NWRA Symposium: Selected Papers. NWRA, St. Cloud, MN.
- Casey, Shirley and Allan Casey. 2003. *Squirrel Rehabilitation Handbook*. WildAgain Wildlife Rehabilitation: Evergreen, CO. Available at www.ewildagain.org
- Moore, Adele and Joosten, Sally. 2002. *NWRA Principles of Wildlife Rehabilitation, 2nd Edition*. NWRA, St. Cloud, MN.
- Nutrition calculator. Provides nutrition and kcal information on milk replacement products and a downloadable calculator in Excel for easy use. Download at www.ewildagain.org.
- WildAgain Wildlife Rehabilitation, Inc. 2005. Mammal Nutrition: Good Wildlife Nutrition is Critical. <http://www.ewildagain.org/Nutrition/nutrition.htm>

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