

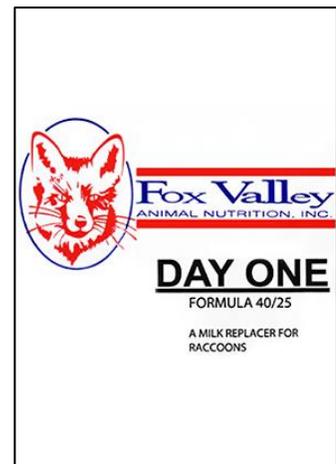


WildAgain Wildlife Rehabilitation, Inc. Evergreen, Colorado.

## Fox Valley 40/25 (2023 sample) – Part 2. Reflections on the product.

Some who read the ingredients and lab tests presented in Part 1 for the updated testing of Fox Valley 40/25 may ask *“If little has changed, do I even need to consider those changes?”* And *“Do such small changes affect the formulas made with that powder?”*

WildAgain believes it helps to take a closer look at Fox Valley 40/25 milk replacer powder, even though the label is the same, the manufacturer says it has not changed and many of the lab test values show only relatively small changes. While the product has *seemed* unchanged for years, it may have changed – especially composition percentages such as the proteins and fats. Manufacturers are *supposed* to update package labels for the product formulation or ingredients within 6 months of any changes – but there is no apparent penalty for noncompliance for up to 2+ years. Plus, it helps to be able to test powder samples of previous years to create a ‘baseline’ for later comparison since products might change in the future.



An increasing number of rehabilitators want greater understanding of (and more detailed test results of) products that have been used for decades. Some may want to know how that product compares with other products (same or different manufacturer), or more detailed test results and cost information. Others are exploring ways to blend powders and other ingredients to arrive at a closer match to species milks. Some rehabilitators are seeking and considering new research and insights about species milks, use of milk powders, ingredients, and strategies to improve effectiveness with animal development and health (e.g., the role and importance of oligosaccharides, fat profiles, microbiota). Others are wondering about growth or health issues with the young on formula, and strategies to improve animal health – even with a product seemingly ‘unchanged.’ There are many reasons rehabilitators are evaluating their practices, even with products they and others have used successfully for years.

## Key highlights of Fox Valley 40/25

1. According to the label and website, no apparent change in the product formulation in 10+ years. Still based on cow milk. Fats still from vegetable oil. Protein primarily from casein. Dietary minerals still present in acceptable concentrations. No pre- or pro-biotics, or preservatives are added.
2. The protein in the test sample has decreased by 1% to 41.8 % and fat increased about 8% recently to 25.5%. Kcals increased slightly due to the higher fat. These are still within the [Guaranteed Analysis-GA](#). The [WildAgain Formula Calculator](#) now contains these new values from the 2023 test sample in the drop-down menu to assist in reviewing prior formula recipe calculations. While seemingly slight increases and decreases, the changes **do** affect formula recipes.
3. Texture continues to be very fine, granular, and non-sticky. This still results in measurement error when measuring by volume (scooping). Weighing the powder eliminates this needless error. Interestingly, the Fox Valley 40/25 powder (2023) tested about 7% less in weight after a pattern of slightly 'gaining weight' over several years. This decrease in weight also will affect nutritional values in prior formula recipes if the recipe fails to account for this weight change.
4. Fox Valley 40/25 has a high level of protein (the first number on the label: 40%). The label indicates multiple protein sources, including dried milk protein; dried skim milk; whey protein concentrate; and casein. This is not uncommon for there to be multiple sources of protein in powdered milk replacers. Those that have high casein content, such as Fox Valley 40/25 have been demonstrated to have poor reconstitution properties. Research also indicates that casein gradually loses some of its reconstitution/solubility properties as it ages after the manufacture date.

Why is this important? Inadequate reconstitution means considerable dry powder will be in the formula that is fed to the animal. That can cause multiple digestive difficulties and GI issues (e.g., bloat, constipation, diarrhea). Incomplete reconstitution means that the animal will likely not have full access to the calcium in the formula since 2/3 of the calcium is contained in casein particles as calcium phosphate. Also, the animal may show slower growth since they are less able to fully digest and utilize the dry powder they were fed – basically under nourishment. They may also resist and struggle eating the formula (perhaps not unlike a person consuming a smoothie containing dry cornmeal).

Changes in mixing method can significantly improve health and growth. A very thorough 5-minute hand whisk/stir is still required to more fully wet, submerge and separate/disperse the unwetted powder that settles to the bottom of a mixing container. While the powder then appears visually to be completely dispersed, previous testing has shown it is still **not** completely reconstituted at this point. Following the [Mixing Guidelines](#), including reconstitution, can significantly improve the available nutrition and reduce GI upset.

## Ingredients/composition

As mentioned, Fox Valley 40/25 is still based on recombined components of cow's milk with fats derived primarily from vegetable oil. More detailed fatty acid profile tests reveal that the fats are about 72.5%

saturated fat. While unknown, this could suggest the primary type of vegetable oil in the product is palm kernel oil(?) as it has one of the highest levels of saturated fats of all vegetable oils. Palm oil is also less costly than coconut oil (which is also high in saturated fat) and it has the best shelf stability. This would explain the product consistently testing very low on Peroxide Value (a measure of rancidity presence and progression) over the last several years. Refrigerated storage is still best to ensure freshness and help to prevent onset of rancidification.

### **The product appears to have no *added* probiotics or prebiotics.**

Research is expanding at an increasing rate on understanding and describing the critical importance of the microbiome (collection of microorganisms in a singular environment, like bacteria in the gastrointestinal tract) and microbiota (the wider community of microorganisms and the *entire* habitat). This research has expanded the understanding of the many important aspects and processes of digestion, health, growth, development and much more in humans and other species. While early research placed considerable focus on the bacteria in the gastrointestinal tract, it has significantly expanded beyond the study of the bacteria in the GI tract to many more aspects. This growing understanding of the microbiome promotes potential uses of select probiotics and prebiotics.

**Probiotics.** Some manufacturers have begun incorporating several beneficial bacteria into milk replacers for human infants and mammal species to support the microbiome in the form of *probiotics*. Fox Valley has *not* included probiotics in 40/25, but for decades has sold a separate probiotic supplement (LA 200) that contains the fermentation product *Lactobacillus Acidophilus*. The manufacturer suggests adding it to prepared formulas to “help maintain the natural balance of intestinal micro-organisms” and for use during and after antibiotic treatment. Recent research on microbiome functions shows the microbiome is much more complex and has many essential functions, beyond following antibiotic use. The need for more diversity and richness in the microbiome likely requires the inclusion many other critically needed bacteria other than simply a single probiotic, e.g., *L. Acidophilus*.

While some microorganisms are common across species, there are also differences among species, development stage, health and individuals. There are further variations in composition depending on diet and even region of the country, influenced by regional habitat differences. This means that a one-size-fits-all single fermentation product (such as *L. Acidophilus*) may miss the mark and provide minimal benefit at best. Some of the more targeted strategies include reintroducing, supplementing and balancing the specific gut microbiome of the species, functions and needs (still in early stages of understanding) and include practices such as use of transfaunation and inoculants.

**Prebiotics.** Mammal milks include both digestible and indigestible carbohydrates. Oligosaccharides, one of the indigestible carbohydrates, have several essential functions: providing a protective barrier for the epithelial lining in the GI system (and helping protect it from pathogens), immune development, microbiome support, aiding gastrointestinal mobility, and serving as ‘food’ for essential GI bacteria and probiotics. Since whole liquid milk ingredients include some oligosaccharides (though limited in cow milk), it is possible that dried skim milk included as a Fox Valley 40/25 ingredient may provide some level of oligosaccharides in the powder.

Since commercial production of milk-based oligosaccharides has not been available with animal milk replacers, indigestible carbohydrates (some of which are called *prebiotics*) have been manufactured from

plants (in the form of fibers) to serve that function and have recently been added to several milk replacer formulations. While the Fox Valley 40/25 label does not disclose *added* prebiotics, it is possible there is some prebiotic benefits found in the dried skim milk. Some rehabilitators have recently begun blending other milk replacers that include *prebiotics* with Fox Valley 40/25 in an attempt to increase the oligosaccharides (e.g., Tailspring puppy or kitten milk replacers) and concurrently achieving a closer overall match of nutritional composition to the species milk.

## **The product label description misleads**

The Fox Valley 40/25 label describes it as a 'milk replacer for 'Raccoons' and provides mixing instructions of 1 part powder to 2 parts water to make the formulas. That seems to suggest that the prepared formula will equally and completely meet the nutritional needs of raccoons. This 1:2 mixing ratio is not uncommon with many other milk replacers that suggest a simple 1:2 ratio of powder to water. The number of published scientific milk composition analyses for raccoons is limited, with 3 choices provided in the drop-down menu in the [Wildagain Formula Calculator](#). Using the Calculator and mixing Fox Valley 40/25 at 1:2, provides a formula recipe that is excessively high in total solids, protein and fat when compared to the mother's milk. Additionally, the overly rich consistency would produce a liquid too thick for a very young and developing animal to safely process through ingestion and digestion.

The species recommendation on the label seems to be more marketing and not matching the species milk. It is more properly regarded simply as a 40% protein and 25% fat powdered milk formulation – period. As such, rehabilitators have used Fox Valley 40/25 effectively as part of a blend with other milk powders and fats to create a formula recipe that achieves a closer match to various species' milk composition for years. It is expected that this blending practice will continue – particularly as rehabilitators choose products to blend based on their nutritional composition, probiotics and natural prebiotics.

## **Suggested feeding amounts and frequency.**

The product label further suggests feeding amounts and frequency for raccoons. While those suggestions are attempts to be helpful, experienced rehabilitators know that there are many more factors involved in deciding feeding amounts and frequency. Considerations include size of the animal, age, developmental stage, hydration level, digestion rate and completeness, weight gain, stool, and much more. Decisions of the amount to be fed at each feeding includes many more factors as well, such as weight (grams), stomach capacity, GI function, growth rate, and amount of solids needed per feeding. The number of feedings per day requires more understanding of the kcals in the formula and the energy requirements of the growing animal, as well as knowledge of the species, health, and development stage. Protocols resulting in poor reconstitution of the milk replacer (such as simply mix with water and feed it immediately) affects the required number of feedings per day, due to a reduced amount of nutrition available. Providing the feeding amounts and frequency on the product label may be well-intended, but it is too vague, could create digestive issues and should be viewed more as marketing.

## **Storage**

The 2023 Fox Valley 40/25 sample that was tested demonstrates very acceptable shelf-stability, testing at n.d. at 252 days post manufacture, which is clearly within established guidelines for edible oils (<10).

This continues the trend of acceptable PV levels in several samples tested over the past several years in this and most other Fox Valley products. Close attention to product freshness and proper handling and storage remains a key defense in to prevent the onset of rancidification. Proper storage protocols generally include refrigeration (or freezing) of the powder in airtight containers and away from sunlight and oxygen (excess air).

## **Other factors that can affect success of any powdered milk replacer product**

**Product quality, availability, and costs.** Availability and the ease of obtaining a product may be factors – but will vary depending on things such as manufacturing capacity, supply chain issues, distributors, storage, and shipping. Quality control is another factor – and, as with all products, continues to deserve monitoring by the end user in its performance with the wild mammal orphans. Cost of the product is certainly another factor that will influence purchase and usage over other similar milk replacers.

**Effective rehabilitation practices** are always important (e.g., hydration, providing supplemental heat for neonates or those with compromised health, minimizing stress, treating parasites, keeping accurate and thorough daily and records).

**Effective feeding practices.** Feed considering the appropriate amount and frequency for the species (e.g., do not over- or underfeed during a 24-hour period) and use clean and appropriately-sized feeding utensils. Equally as important is monitoring stool - frequency, amount, and consistency. This can provide direct clues as to whether the milk replacer (product and formula recipe) is working successfully with the specific species, age, developmental level, and overall health of the animal.

**Modifications for use.** Fox Valley 40/25 is a milk replacer powder marketed and labeled for use with raccoons. Rehabilitators should review published scientific [milk composition analysis studies for their species](#). Recipe modifications are generally needed to create a closer match to the milk of the wild mammal species in their care. Calculating formulas for different species can be a complex and time-consuming exercise – again, consider using the Wildlife Formula Calculator.

**Modifications through blended formulas.** Many times, matching mother's milk can be more closely achieved by blending several milk replacer powders and possibly adding other ingredients. Since individual powdered milk replacer products will reconstitute in slightly different ways, specific blending protocols should be followed to do so effectively and safely. This means reconstituting each powder individually and combining only after each has fully reconstituted in liquid form. ([Mixing Guide](#))

**More.** Stay alert to and consider expanding research related to nutrition, health and more that can affect these topics, such as microbiome, glycans, oligosaccharides, manufacturing changes.

\*\*\*

## Disclosures

Product assays performed by the independent lab, as presented in Part 1, and referred to here in Part 2, adhere to the *Official Methods of Analysis of AOAC INTERNATIONAL* (Association of Official Analytical Chemists) and the *Official Methods and Recommended Practices of the AOCS* (American Oil Chemists Society).

The authors have no conflicts of interest with the independent lab, or any of the products or manufacturers discussed in this article.

## Resources

Ackerman, Dorothy L; Kelly M Craft; and Steven D Townsend. 2006. Infant Food Applications of Complex Carbohydrates: Structure, Synthesis and Function. *Carbohydr Res.* 2017 Jan 2; 437:16-27. doi: 10.1016/j.carres.2016.11.007. Epub 2016 Nov 11. PMID: 27883906; PMCID: PMC6172010.

Cheng, Lianghui, Renate Akkerman, et al. 2021. More than sugar in milk: human milk oligosaccharides as essential bioactive molecules in breast milk and current insight into beneficial effects. *Critical Reviews in Food Science and Nutrition.*

Cho, Susan, and Priscilla Samuel, eds. 2009. *Fiber Ingredients - Food Applications and Health Benefits.* ISBN 9781420043846 CRC Press.

*WildAgain Wildlife Rehabilitation © Copyright 2024. All rights reserved.*