

## Using the Calculator to Develop a Formula Recipe: Demonstration for Eastern Gray Squirrel

[Video Notes – Copies of charts and tables, plus key notes]

Products and recipes shown are for illustrative purposes only to demonstrate use of the Calculator!!

**Step 1** - Select the species study from the drop-down menu. Select an individual study or the average. The 'Mother's Milk' column provides species milk composition and a good starting point for Step 2. For this species, the percentage of fat exceeds the percentage of protein by 3.3 percentage points. In absolute terms, that means there is about 1/3 more fat in the milk than protein. That provides two clues for starting. First, consider milk replacer products that also have more fat than protein as shown on the product label and on the TNA tab of the Calculator workbook. Secondly, that high level of fat in Eastern Gray Squirrel milk suggests additional fat may be needed beyond that available in the milk replacer powders.

Formula Components	Wet matter basis (as fed)	
	Your Recipe	Mother's Milk
Solid	0.0%	26.5%
Protein	0.0%	9.1%
Fat	0.0%	12.4%
Carbs.	0.0%	3.2%

**Step 2** - Select one or more milk replacer powder products. Use of the TNA (Typical Nutrition Analysis) tab in the Calculator workbook that contains product nutritional composition data from independent lab testing. If the species milk composition is high in fat, start with those (as in the first 5 at right). If the milk is high in protein, start with those. Or if the blend needs more protein, add some of those (as the 3 shown at right). Pay attention to the year of manufacture. Select a milk powder product and year that you have, or simply use the most current listed in the drop-down menu.

	Solids	Protein	Fat	Carbs
FV 32/40 (2022)	93.9	35.9	40.7	8.7
Esbilac (2022)	94.9	32.9	41.1	15.6
FV 20/50 (2020)	93.0	25.8	50.1	7.2
ZMM 33/40	95.5	35.1	42.1	9.3
HWC	42.7	2.2	36.8	3.2
	Solids	Protein	Fat	Carbs
FV 20/50 (2020)	93.0	25.8	50.1	7.2
KMR (2022)	93.7	40.8	28.0	18.9
Tailspring Kitten	91.4	44.0	26.8	13.8
ZMM 42/25 ('22)	93.4	41.8	26.6	16.8
HWC	42.7	2.2	36.8	3.2

**Step 3** - Input amounts for one or more products. Try for 70% match of Total solids and major nutritional components. Work to get the solids, proteins, fats, and carbs in the recipe in 65-75% in 'range', preferably a balance close to the 70% target.

Adjustments usually needed in the milk replacer powders, amounts of fats, and amounts of water. During this back and forth process, smaller adjustments are better for fine-tuning a recipe.

Recap of steps constructing this recipe example for Ea. Gray Squirrel milk

Your Recipe as a % of Mother's Milk (see note below)	Your Recipe as a % of Mother's Milk (see note below)	Your Recipe as a % of Mother's Milk (see note below)	Your Recipe as a % of Mother's Milk (see note below)	Your Recipe as a % of Mother's Milk (see note below)	Your Recipe as a % of Mother's Milk (see note below)
70%	63%	65%	66%	68%	70%
74%	67%	66%	66%	68%	70%
65%	58%	63%	66%	68%	70%
75%	64%	65%	66%	68%	70%
68%	61%	64%	66%	68%	70%
Blend products	Adjust blend	Add HWC	Add HWC	Reduce water	Reduce water
1 pt FV 32/40 1 pt Esbilac (both 2022) 4 pts water	1 pt FV 32/40 → .75 pt Esbilac 4 pts water	1 pt FV 32/40 .75 pt Esbilac 4 pts water → .1 pt HWC	1 pt FV 32/40 .75 pt Esbilac 4 pts water → .15 pt HWC	1 pt FV 32/40 → .75 pt Esbilac → 3.8 pts water → .15 pt HWC	1 pt FV 32/40 → .75 pt Esbilac → 3.7 pts water → .15 pt HWC
Not a match	Better, but fats are low	Fats higher, but still low	Fats better, all solids low	Solids improving, still low	Excellent balance/match

pt = part  
HWC = Heavy whipping cream  
Source: Wildlife Milk Formula Calculator, ewildagain.org

The first recap of adjustments at right shows the progression of steps used in the video to create a recipe using FV 32/40, Esbilac, water and HWC. It provides the thinking or rationale for each next step. It also demonstrates the impact that very small adjustments can make on constructing a final recipe.

The second recap shows using two completely different products to arrive at a recipe for the same species. In this case using Fox Valley 20/50 and Tailspring Kitten, along with water and HWC. Even though the carbs are lower than the other components, this could be considered an acceptable recipe.

Your Recipe as a % of Mother's Milk (see note below)	Your Recipe as a % of Mother's Milk (see note below)	Your Recipe as a % of Mother's Milk (see note below)
69%	74%	70%
76%	73%	70%
61%	75%	71%
65%	67%	64%
65%	74%	70%
Blend products	Add HWC	Add water
1 pt FV 20/50 (2022) 1 pt TS Kitten 4 pts water	1 pt FV 20/50 1 pt TS Kitten → 4 pts water → .3 pt HWC	1 pt FV 20/50 1 pt TS Kitten → 4.3 pts water → .3 pt HWC
Fats are low	Fats better, solids high	Acceptable match

pt = part  
HWC = Heavy whipping cream  
TS = Tailspring  
Source: Wildlife Milk Formula Calculator, ewildagain.org



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## Using the Calculator to Develop a Formula Recipe: Practice Set: Suggested Checklist of Steps

- 1.) Step 1 - Select the species study from the drop-down menu. Select an individual species study or select the average of several studies.
  
- 2.) Step 2 - Select one or more milk replacer powder products. Make use of the TNA (Typical Nutrition Analysis) tab in the Calculator workbook that contains product nutritional composition data from independent lab testing. If the species milk composition is high in fat, start with those. If the milk is high in protein, start with those. Pay attention to the year of manufacture. Select a milk powder product and year that you have, or use the most current listed in the drop-down menu.
  
- 3.) Step 3 - Input amounts for one or more products. Try for 70% match of solids and major nutritional components.
  - Fine tune and adjust in Step 3.
  - Adjust the blend between a couple of products. Change the mix of products if needed.
  - Add fat (e.g., HWC).
  - Add/subtract water to adjust the Total solids close to 70%.
  - Focus on the Total solids, protein and fat. These should all be within 1-3 % points of each other.
  - Give less priority to carbs if all others look like a match.
  - Start by inputting parts. Use decimal points as fractions of parts are usually required.
  - Also consider input in weights rather than parts. Use only one method in Step 3 – not both.
  - The Measurement Guide will convert the parts (and fractions of parts) to gram weights.
  
- 4.) Rewatch portions of the video. Pause the video at any point. Take notes. As you watch, replicate the steps in your downloaded copy of the Calculator.
  
- 5.) This takes time and practice. Fine tune as you work through a recipe. Make small adjustments. A final recipe is unlikely to happen instantly with the first attempts. Be patient!

### **Related resources on ewildagain.org:**

Check out the **'Formula and Feeding'** section for much more on **Proteins; Fats; and Carbs** and their vital roles in nutrition and health.

In-depth lab analysis and **milk replacer reviews** for a dozen commonly used products are also included in this section. This includes TNA data; fatty acid profiles; rancidity tests; and reconstitution performance.

Visit the **'Quick Reads'** section for more on **Lot Numbers [how to read]** and **Reading/Decoding Product Labels**.

Often cryptic and confusing, disclosures on the product packaging can tell us important info.