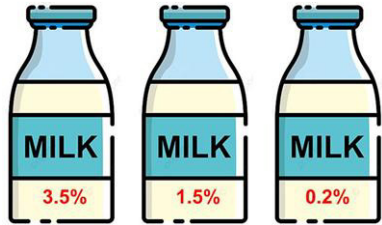


# Milk Mixing Puzzle

27 May 2023

Jim Stevenson



[pngtree.com](https://www.pngtree.com)

This is a classic example of a mixture problem from Dan Griller ([1]) that recalls my agonies of beginning algebra.

In Cauchy Village, full fat milk has 3.5% fat content, semi-skimmed milk has a 1.5% fat content, and skimmed milk has a 0.2% fat content. How many liters of full fat milk must be added to 100 liters of skimmed milk to produce semi-skimmed milk?

## Solution

The key to solving mixture problems like this is to convert from percentages to actual amounts. So let  $x$  be the number of liters of full fat milk we want to use, then the amount of fat we get from this is  $0.035x$ . From 100 liters of skim milk we get  $0.002 \cdot 100$  amount of fat. We want the final volume of milk to be 1.5% fat or hold  $0.015(x + 100)$  amount of fat. So the final relationship equates the amounts of fat to get

$$0.015(x + 100) = 0.035x + 0.002 \cdot 100,$$

which yields

$$0.02x = 1.3 \quad \text{or} \quad x = 65 \text{ liters.}$$

## References

- [1] Griller, Daniel, *A Ring of Cats and Dogs and Other Curious Puzzles*, Rational Falcon, 2022. Diamond Problem #19. (Scale of difficulty: Bronze, Silver, Gold, Diamond.)

© 2023 James Stevenson

---