

Children's Wisconsin Clinical Nutrition Department

Genetics - PKU: Case Study (Answer Key)

1. Amount of phe required per day / amount of phe in 100g standard infant formula

$$180 \text{ mg phe} / 430 \text{ mg phe} = 0.42$$

$$0.42 \times 100 = \mathbf{42 \text{ g standard infant formula needed to meet daily phe requirement}}$$

- 1a. Amount of standard formula x protein provided in 100g of standard formula

$$0.42 \times 10.8 \text{ g protein} = \mathbf{4.5 \text{ g protein in standard infant formula}}$$

2. Protein goal x infant weight = daily protein requirement

$$3.0 \text{ g protein} \times 4 \text{ kg} = \mathbf{12 \text{ g total protein requirement}}$$

3. Daily protein requirement – protein provided by standard infant formula

$$12\text{g} - 4.5 \text{ g} = \mathbf{7.5 \text{ g needed from medical food to fill diet prescription}}$$

4. Protein needed to fill prescription / protein provided in 100g medical food

$$7.5\text{g} / 13.5 \text{ g} = 0.56$$

$$0.56 \times 100 = \mathbf{56 \text{ g phe-free medical food required to fill diet prescription}}$$

- 5a. Amount of standard infant formula x kcal in 100g of standard formula

$$0.42 \times 510 \text{ calories} = \mathbf{215 \text{ kcal in standard infant formula}}$$

- 5b. Amount of phe-free medical food x kcal of 100g of phe-free medical food

$$0.56 \times 473 \text{ kcal} = \mathbf{265 \text{ kcal from phe-free medical food}}$$

- 5c. Add standard formula + phe-free medical food for total kcal provided in diet prescription:

$$214 \text{ kcal} + 265 \text{ kcal} = \mathbf{479 \text{ kcal}}$$

$$479 \text{ kcal} / 4.0 \text{ kg} = \mathbf{120 \text{ kcal/kg}}$$

6. Amount of total calories provided by diet prescription / 20 kcal/oz = number of ounces of formula needed provide caloric concentration of 20 kcal/oz

$$479 \text{ kcal} / 20 \text{ kcal/oz} = \mathbf{23.95 \text{ oz of formula}}$$

(If final volume prescribed is 24 oz, caloric concentration will be 20 kcal/oz; if final volume prescribed is 23 oz caloric concentration will be 20.8 kcal/oz – either is acceptable)

7. Step 1: Determine displacement of powders: 42g standard infant formula + 56g phe-free medical food = 98g powder x avg displacement 0.76mL/g = 74mL displaced

$$\text{Step 2: } 24\text{oz goal volume (720mL)} - 74\text{mL displacement} = \mathbf{646\text{mL water needed (21.5oz water)}}$$