

Bye-bye Antibiotic Chickens

Did you know that adding antibiotics to animal feed can help chickens and cows grow bigger, and faster? This has been a common practice since the 1950s to help farms save time and money. But now, scientists believe this might be causing antibiotic-resistant diseases in humans. That's why there's a big push for farms to stop using antibiotics in animal feed, and McDonald's is joining the movement!

In 1925, it took 112 days to raise a chicken to market size (about 2.5 to 3.5 pounds). Today, chickens grow much bigger—about 6.5 pounds—in just 47 days!

1. Compare how many chickens you could raise in a year in 1925 versus today if you could house 1,000 chickens at a time.

$$\begin{aligned} &\text{1925:} \\ &\frac{365 \text{ days}}{112 \text{ days per 1,000 chickens}} = 3.26... \\ &\approx 3 \text{ broods} \\ &\text{So a little over 3,000 chickens} \end{aligned}$$

$$\begin{aligned} &\text{Today:} \\ &\frac{365 \text{ days}}{47 \text{ days per 1,000 chickens}} = 7.77... \\ &\approx 8 \text{ broods} \\ &\text{Almost 8,000 chickens} \end{aligned}$$

In the same amount of time, there's about a 5,000 chicken difference between 1925 and today. That's nearly three times as many chickens raised now compared to then!

Today, chicken is sold for about \$1.46 per pound.

2. Suppose you sell the chickens when they reach their market weight of 1.5 kg. (1kg $\approx$ 2.2 lbs). How much would you have earned in 1925? How much would you earn today? Show your work.

$$\begin{aligned} &\text{1925:} \\ &1.5 \text{ kg} \times \frac{2.2 \text{ lbs}}{1 \text{ kg}} = 3.3 \text{ lbs} \\ &3.3 \text{ lbs/chicken} \times \frac{\$1.46}{\text{lb}} \times 3,000 \text{ chickens} = \$14,454 \\ &\approx \$14,500 \end{aligned}$$

$$\begin{aligned} &\text{Today:} \\ &3.3 \text{ lbs/chicken} \times \frac{\$1.46}{\text{lb}} \times 8,000 \text{ chickens} = \$38,544 \\ &\approx \$38,500 \end{aligned}$$

3. Does the price difference in the previous question make sense? Do you think the price difference would actually be higher or lower? Why?

Since chickens today are larger than 1.5 kg, they would cost more. Also, the price of \$1.46 per pound reflects today's rates, so chicken would have been cheaper in 1925. Therefore, I think the price difference (earnings) would be much higher today compared to 1925.

4. Why do you think farmers might want to use antibiotics when raising chickens? And why might restaurants or grocery stores want to sell chickens raised with antibiotics?

Answers will vary. Some example responses:

Raising chickens in tight spaces can lead to more infections, so antibiotics help keep the birds healthy and grow faster. This makes farming cheaper and more efficient, which is important for restaurants and grocery stores to cut costs.

If customers aren't concerned about antibiotics in their food, restaurants, and grocery stores will most likely choose cheaper options to maximize profits, but they could lose customers if people start caring about the health risks.

Whole Foods, a natural foods grocery chain in the U.S., guarantees that its chickens are raised without antibiotics or growth hormones, priced at \$2.99 per pound. In comparison, a similar chicken at a smaller local grocery store, likely containing antibiotics, costs \$1.69 per pound.

5. Based on the price differences between Whole Foods and a local grocery store, *estimate* the price of chicken McNuggets at McDonald's if they switch to selling only chicken raised without antibiotics. Keep in mind that this is a *rough estimate*. Be sure to show your work.

Students could approach this estimation in different ways like using a ratio or percentage increase as below:

Item	Price	Future price (antibiotics free)
10 Piece McNuggets	\$5.60	$x = \text{The price of 10 piece McNuggets (antibiotics free)}$ $\frac{\$5.60}{1.69 \text{ per pound}} = \frac{x}{2.99 \text{ per pound}}$ $x \approx 9.908$ $x \approx \$9.90$
20 Piece McNuggets	\$6.59	$x = \text{The price of 20 piece McNuggets (antibiotics free)}$ $\text{Price increase percentage} = \frac{\$2.99 - \$1.69}{\$1.69} \approx 77\%$ $x = 6.59(1 + 0.77) = 11.6643$ $x \approx 11.65$

Note: In August 2016, the company fulfilled its commitment to stop using antibiotics in chicken production for McDonald's USA. The company plans to prohibit the use of antibiotics most valuable in human medicine in chicken served worldwide by 2027.

If McDonald's and other restaurants decide to use only chickens raised without antibiotics, chicken farms might need to change how they raise their chickens to meet the demand. Some chicken farms today keep as many as 20,000 chickens in one large shed. These sheds are about 400 feet long and 50 feet wide. (1 foot $\approx$ 30.48 cm)

6. Calculate how much space each chicken has in one of these sheds. Compare it to something you know and explain if you think that's enough space.

$$\begin{aligned} \text{Area per chicken} &= \frac{400 \text{ feet} \times 50 \text{ feet}}{20,000 \text{ chickens}} \\ &= 1 \text{ square foot per chicken} \end{aligned}$$

This is about the size of a laptop or a standard textbook, which is definitely not enough room for a chicken to move around comfortably.

Teaching tips: Answers will vary based on what they choose to compare it to, but the goal is for them to better grasp how much (or how little) space 1 square foot represents. Perhaps use a ruler to help them visualize.

7. How much space do you think would be reasonable to give each chicken (antibiotic-free) and why?

Answers will vary, but a reasonable estimate is around 10 square feet per chicken. In Europe, free-range/antibiotic-free chickens need about one square meter (about 10.7 square feet of outdoor space). These chickens grow slower and may take up to 8 weeks to reach market weight. Giving chickens enough space is important for their health, so they can scratch, peck, and exercise, just like how we need room to move and stay healthy too.

8. How do you think the shift to all antibiotic-free chicken will affect farmers, consumers, and businesses? Do you think this change is a good idea? Why or why not?

Enjoy the discussion.

"Switching to all antibiotic-free chickens will probably make things harder for farmers because they will need more space and fewer chickens. That could make chicken more expensive for people to buy. But it might be a good thing because the chickens would be healthier, and we would not get sick from antibiotics from the chickens as much. It could be better for the environment too, but it might also make it harder for some businesses to afford the chickens, so they will raise prices."

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Sources:

<https://feedthemwisely.com/fast-food-restaurants-antibiotics>

<https://www.alltech.com/blog/future-antibiotics-poultry-feed>