

# Think the Antibiotics in Your Food Are Decreasing? Think Again

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## STORY AT-A-GLANCE

- › An estimated 35,000 Americans die each year from drug-resistant infections. Globally, the death toll attributed to drug-resistant infections is thought to be around 4.95 million annually
- › When animals are given antibiotics, it causes unnatural growth by altering their gut microbiome. In the process, some of those gut bacteria become antibiotic-resistant. Contaminated meat can then become a source of drug-resistant infections
- › Between 2015 and 2017, antibiotic use in U.S. food-animals declined by 42%, but the downward trend didn't last. In the years between 2017 and 2022, antibiotic use increased by 12%, 4.3% of that rise occurring in 2022 alone. Other data show the number of animals raised in 2022 was lower than 2021, so more antibiotics were used in a smaller number of animals
- › Antibiotics are also massively overused in human medicine, and have risks besides the promotion of drug-resistance. Fluoroquinolones have been shown to increase your risk of aortic rupture, which can lead to death. Several oral antibiotics have also been linked to the development of kidney stones, inflammatory bowel disease (IBD) and colorectal cancer
- › Natural antimicrobials that do not appear to promote drug resistance include garlic, ginger, echinacea, goldenseal, myrrh oil, thyme oil, oregano oil, clove extract, olive leaf extract and colloidal silver

Antibiotic-resistant infections are a vastly underestimated health threat. An estimated 35,000 Americans die each year from drug-resistant infections.<sup>1</sup> Globally, the death toll attributed to drug-resistant infections could be as high as 4.95 million annually,<sup>2</sup> and it's only getting worse.

**Agriculture has played a central role** in this trend. As of 2020, 69% of the U.S. antibiotic supply was bought up by the meat industry,<sup>3</sup> and most of these antibiotics are given to animals that aren't sick; rather, they're used for prophylactic and/or growth promotion purposes.

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## **Antibiotic Ban Lowers Antibiotic-Resistant Infections in Humans**

Governments have tried to tackle the growing problem of antibiotic resistance for decades. The European Union led the way by banning the use of antibiotics for growth promotion purposes in 2006.

In 2013, the U.S. Food and Drug Administration issued guidance that called on farmers to voluntarily begin to phase out the use of medically important antibiotics in livestock production.<sup>4</sup>

In 2017, the World Health Organization urged farmers to stop the routine use of antibiotics “to promote growth and prevent disease in healthy animals” to preserve the effectiveness of antibiotics used in human medicine.<sup>5</sup> That same year, the U.S. government also tightened federal rules to prevent the use of antibiotics for growth promotion.

A year later, in 2018, California became the first U.S. state to ban the routine preventive use of antibiotics in food-animal production, as well as any antibiotic use without a veterinarian's prescription<sup>6</sup> — a decision later confirmed to have had a beneficial impact,

reducing the prevalence of extended-spectrum cephalosporin-resistant *E. coli* in the human population by 7.1% in the following three years.<sup>7,8</sup>

Conversely, in the U.K. — the only European country where antibiotics are still allowed to be used prophylactically in food-animals — UK Health Security Agency data show the prevalence of serious antibiotic-resistant infections rose by 2.2% between 2020 and 2021.<sup>9</sup> Compared to Denmark and the Netherlands, British pig farmers use 2.5 times more antibiotics per pig.<sup>10</sup>

In January 2022, the EU further restricted the use of agricultural antibiotics, banning “all forms of routine use in farming, including preventative group treatments.”<sup>11</sup>

## **Antibiotic Use Is Going in the Wrong Direction**

Between 2015 and 2017, antibiotic use in the U.S. declined by 42%, but the downward trend didn't last. In the years between 2017 and 2022, antibiotic use increased by 12%; 4.3% of that rise occurring in 2022 alone.<sup>12</sup> As reported by Sentient Media, January 9, 2024:<sup>13</sup>

*“The Food and Drug Administration data show sales of medically important antimicrobials approved for use in farm animals rose 4.3% to 6.25 million kilograms in 2022.*

*The 2022 figure is a significant decrease on the 8.36 million kilograms sold in 2016, the earliest year shown in the data. But the 2022 figure is higher than all other years since 2016, indicating a more recent trend in the wrong direction.*

*Thomas Van Boeckel, an expert in global antimicrobial usage and resistance in farm animals, fish and humans, says the upward swing indicates that ‘unlike some European and Asian countries ... the U.S. is clearly not on a trend that shows its commitment to sustainably reduce antimicrobial use in animals.’*

*The data, he adds, shows the problem is ‘mostly a pig and cattle issue’ and reveals ‘a dependence’ by the livestock sector on antibiotics that has ‘potential*

*consequences on the continued development of resistance' ...*

*[A]ccording to FACT's Steven Roach, a closer look at the data suggests sales may be even higher. 'If you look at the more detailed biomass data ... it shows that animal numbers were down in 2022 compared to 2021 so when corrected for biomass the [medically important antimicrobial] sales increases are even larger.'"*

## **Antibiotics Pose Hidden Health Risks**

Antibiotics are also massively overused in human medicine, which also contributes to the development of drug resistance. Antibiotic misuse and overuse also puts your health at risk in other ways.

For example, [fluoroquinolones](#) have been shown to increase your risk of aortic dissection (a tear in the wall of the major artery, allowing blood to flow between the layers) or aortic rupture, which can lead to death.

And even though these antibiotics carry a "black-box" warning, fluoroquinolones are still often prescribed for upper respiratory infections and urinary tract infections (UTIs). In fact, according to a 2022 investigation,<sup>14</sup> fluoroquinolones remain among the most-prescribed antibiotics in the world.

As noted by the authors, the lack of understanding of the risk profile of this class of antibiotics is putting patients at risk, and there's "a dire need" to initiate educational campaigns among health care professionals to prevent unnecessary harm to patients.

Fluoroquinolones, along with nitrofurantoin, cephalosporins, sulfas and broad-spectrum penicillins, have also been [linked to the development of kidney stones](#). The association is most pronounced among younger children and, with the exception of broad-spectrum penicillin, this risk remains statistically significant for up to five years after exposure.

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Studies have also found an association between **oral antibiotics and inflammatory bowel disease** (IBD) and colorectal cancer, likely due to disruption of the gut microbiome.

According to research presented at the Digestive Disease Week conference held in San Diego, California, in May 2022, use of antibiotics was associated with a 64% increased risk of developing IBD, and the risk increased with additional doses.<sup>15</sup>

Compared with those who had taken no antibiotics in the previous five years, the risk of IBD in those who received five or more antibiotics prescriptions was increased by 236%. And, while all classes of antibiotics were associated with increased IBD risk, fluoroquinolones again took the lead, having the strongest association.

## **Natural Antimicrobials to the Rescue**

Considering their many risks, I advise using antibiotics only as a last resort. The good news is there are many natural plant-based remedies that will help kill bacteria without the risk of building resistance, including the following.

**Garlic** — Garlic has been used to fight bacterial and parasitical infections for centuries. According to a 2014 review,<sup>16</sup> garlic has been proven effective against “a plethora of gram-positive, gram-negative, and acid-fast bacteria,” including but not limited to Salmonella, E. coli, Klebsiella, Clostridium and Vancomycin-resistant enterococcus.

Importantly, garlic “exerts a differential inhibition between beneficial intestinal microflora and potentially harmful enterobacteria,” meaning it inhibits bad bacteria while leaving good bacteria alone.<sup>17</sup>

Research also supports the use of garlic and garlic derivatives for chronic external- and middle-ear infections.<sup>18</sup> Garlic-infused oils are commercially available, but it's also easy to make your own.<sup>19</sup>

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**Ginger** — A 2020 study<sup>20</sup> demonstrated that ginger essential oil was effective against *E. coli* and *S. aureus*, two bacteria involved in periodontal infections. Another study<sup>21</sup> found a 10% ginger extract effectively killed *Streptococcus mutans*, *Candida albicans* and *Enterococcus faecalis*, which are also implicated in the causation of oral infections. More than a dozen other bacteria are also vulnerable to its effects,<sup>22</sup> as are a number of biofilms.<sup>23</sup>

Ginger is not suitable for children under age 2, and adults should not take more than 4 grams of ginger per day. Pregnant women are advised to cap their intake at 1 gram per day.<sup>24</sup>

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**Echinacea** — According to Mount Sinai Hospital,<sup>25</sup> **echinacea** extract may be used to treat “urinary tract infections, vaginal yeast (*Candida*) infections, ear infections (also known as otitis media), athlete's foot, sinusitis, hay fever (also called allergic rhinitis), as well as slow-healing wounds.” As a general recommendation for infection, take it three times a day for a maximum of 10 days.<sup>26</sup>

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**Goldenseal** — One of the main constituents of goldenseal is **berberine**, known for its potent antibacterial properties. Berberine primarily kills gram-positive bacteria, including MRSA.

According to Mount Sinai,<sup>27</sup> goldenseal is not recommended for pregnant or breastfeeding women, and those with high blood pressure, liver disease or heart disease should discuss its use with their medical provider, as it can interfere with

medications prescribed for these conditions. Potential adverse effects include irritation of the skin, mouth, throat and vagina, and increased sensitivity to sunlight.

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**Myrrh oil** – When an antibiotic fails to kill off all the bacteria, you can end up with nongrowing bacterial persister cells. While these persisters do not undergo genetic change to make them resistant to the antibiotic, they often end up forming biofilms and are a major cause of chronic low-grade infections.<sup>28</sup>

This is where myrrh oil really shines, as research<sup>29</sup> shows it preferentially kills off these nongrowing persister cells, and do so without the risk of promoting resistance. Other research suggests it may be useful in the treatment of gingivitis,<sup>30</sup> treatment-resistant trichomoniasis vaginalis<sup>31</sup> (a sexually transmitted disease) and Lyme disease.<sup>32</sup>

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**Thyme (including thyme essential oil)** – Thyme oil has antibacterial, antibiofilm, antiviral, antifungal and antiseptic properties. However, make sure you're using either standardized thyme preparations or essential oils that meet the requirements of national pharmacopeias.<sup>33</sup> What you're looking for in thyme preparations are minimum thymol and carvacrol contents of 40%. In essential oils, you want 37 to 55% thymol and 0.5 to 5.5% carvacrol.

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**Oregano oil** – Oregano oil has shown effectiveness against bacteria such as *Streptococcus mutans*,<sup>34</sup> which causes dental cavities, as well as 11 different multidrug-resistant bacteria, including MRSA, and their biofilms.<sup>35</sup> Tests have confirmed that repeated use of oregano oil does not lead to resistance, which makes it a useful remedy in the treatment of wounds.<sup>36</sup>

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**Clove extract** – Research has shown ethanolic clove extract provides broad-spectrum inhibition against both gram-negative and gram-positive UTI-causing pathogens such as *Proteus mirabilis*, *Staphylococcus epidermidis*, *S. aureus*, *E. coli* and *K. pneumoniae*.<sup>37</sup>

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**Olive leaf extract** – Olive leaf extract has been shown to be effective against bacteria

such as *Klebsiella*, *Staphylococcus aureus*, *E. coli* and *Salmonella*.<sup>38</sup>

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**Colloidal silver** — Colloidal silver has been regarded as an effective natural antibiotic for centuries, and research suggests it can even help eradicate multidrug-resistant gram-positive and gram-negative bacteria.<sup>39</sup>

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