



**Global  
Aquaculture  
Alliance™**

**GAA response to CBC Marketplace about detection of  
antibiotic-resistant bacteria in retail samples of shrimp**

Global Aquaculture Alliance  
February 11, 2019

Antimicrobial resistance (AMR), the ability of microorganisms to render human and veterinary medicines ineffective over time, is becoming one of the world's biggest public health challenges. This has prompted a call to action for stewardship of antibiotic use in human health care and animal agriculture to reduce unnecessary use and extend the lifespan of these drugs. The Global Aquaculture Alliance fully supports these efforts through a range of programs.

While it is important to combat AMR in all foods, this is a human-health issue regarding the long-term effectiveness of life-saving antibiotics. It would be misleading to present this as a food-safety issue, because there is no indication that our food supply, and especially shrimp, is unsafe. In the United States, there has been no increase in reported incidences of foodborne illnesses associated with farm-raised or imported shrimp in the past two decades, even though production and consumption of shrimp has increased significantly during that time.

To assure that appropriate environmental, social and food-safety practices are implemented at aquaculture facilities around the world, GAA has developed Best Aquaculture Practices standards for hatcheries, farms, feed mills, and processing plants. Hatcheries and farms wishing to become certified to this program must develop health-management plans that define their procedures for disease diagnostics, water quality management, disinfection and dry-out, quarantine and vaccination.

BAP standards prohibit antibiotic use for disease prevention or growth but allow antibiotic use for treatment of disease under the supervision of animal health professionals. Proper withholding periods after treatment assure that residuals in food products are below established guidelines. Records must be maintained for every application of antibiotics, including the date of use, compound used, reason(s) for use, antibiotic sensitivity test results, dosage and harvest date.

BAP standards also monitor for presence of antibiotic residues in final products at the processing plant. Samples are collected by third party auditors and tested in approved laboratories. If positives are detected, sampling frequency is increased until the source of contaminated product is eliminated. Failure to promptly eliminate residues leads to suspension from the BAP program.

In September 2018, GAA's multi-stakeholder Standards Oversight Committee (SOC) voted to strengthen its stance on antimicrobial use at the farm level in response to growing concern about AMR in humans. The BAP finfish and crustacean farm standards and salmon farm standards will prohibit the use of any antimicrobial that appears on the World Health Organization (WHO) list of critically important antimicrobials, effective at the end of 2020, for all species except tilapia, for which the ban is already in effect.



**Global  
Aquaculture  
Alliance™**

A review of antibiotic stewardship programs indicates important progress, but we still have far to go. A 2014 Report to the President of the United States indicated that only 50 percent of U.S. hospitals have implemented antibiotic stewardship programs, and a 2016 report from the CDC indicated that at least 30 percent of antibiotic prescriptions in doctors' offices and emergency departments are unnecessary. In terrestrial animal agriculture, a 2018 U.S. Food and Drug Administration report found that antibiotic-resistant bacteria exist on 79 percent of ground turkey, 71 percent of pork chops, 62 percent of ground beef and 36 percent of chicken breasts, wings and thighs. In the current sampling of shrimp in retail stores by CBC Marketplace, 18 percent of samples contained antibiotic-resistant bacteria. This is less than in terrestrial animal proteins, but indicative of the challenge that lies before us.

In aquaculture, antibiotic stewardship varies by country and by species. Perhaps the best example occurs in Norwegian salmon farming, where antibiotic use dropped precipitously due to effective use of vaccines, area management and stringent government regulations.

The challenges are greater with shrimp farming, because the primitive immune system of shrimp does not respond to vaccines. Disease control requires a comprehensive program with genetic selection for disease resistance, hatchery management to produce high health juveniles, grow-out with proper management protocols, and area management to encourage all farms within a hydrographic zone to collaborate. In areas like India, where shrimp farming has rapidly expanded based on small family farms, the challenge is education and training.

GAA identifies such issues and develops consensus solutions at its annual GOAL conference, which brings together stakeholders from industry, government, academia and the conservation community. This year, GAA is convening its 20th GOAL conference in Chennai, India, in October to engage more closely with stakeholders and specifically address AMR. Information updates are communicated to the sector through GAA's Global Aquaculture Advocate publication. GAA also conducts disease and food-safety studies in collaboration with the World Bank to help understand why disease outbreaks occur and how they can be prevented in the future.

Thank you for your help in highlighting the issue of AMR, one of the biggest public health concerns of our time.

## Summary

### What this study found:

- Antibiotic resistance in bacteria from frozen shrimp sold in retail outlets in Canada. Resistance levels were less than those reported in terrestrial proteins.

### What this study did not find:



**Global  
Aquaculture  
Alliance™**

- The presence of traces of antibiotic-resistant bacteria in samples of shrimp does not indicate that shrimp are unsafe to eat. Bacteria are naturally present in all foods, but cooking destroys bacteria. Even in the cooked product, traces of bacteria do not constitute a food-safety hazard, because bacteria must be present at an infective dose. The concentration of bacteria was not measured in the study.
- That the sampled shrimp in this study were treated with antibiotics at the farm. Antibiotic-resistant bacteria on a given food product can originate from contaminated soil or water from other sources, e.g. fruits and vegetables irrigated with contaminated water (see below). In this case, the resistant bacteria might have originated from the estuarine water used to fill the shrimp ponds (general environmental contamination).
- That the sampled shrimp in this study had an antibiotic residual. We see no data to that effect.

### References

Report to the President on combating antibiotic resistance

<https://www.cdc.gov/drugresistance/pdf/report-to-the-president-on-combating-antibiotic-resistance.pdf>

CDC: One in three antibiotic prescriptions unnecessary

<https://www.cdc.gov/media/releases/2016/p0503-unnecessary-prescriptions.html>

Surveillance for Foodborne Disease Outbreaks — United States, 2009–2015

<https://www.cdc.gov/mmwr/volumes/67/ss/ss6710a1.htm>

“Superbugs” Seen in Majority of Supermarket Meat

<https://www.webmd.com/food-recipes/food-poisoning/news/20180628/superbugs-seen-in-majority-of-supermarket-meat>