Food Safety

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Food is the third most basic human need, following air and water. It is a fundamental right enshrined in the Universal Declaration of Human Rights and a cornerstone of the Sustainable Development Goals (SDGs), particularly in ensuring Good Health and Well-being (SDG 3), achieving Zero Hunger (SDG 2), and promoting Responsible Consumption and Production (SDG 12).

The right to food implies more than just access; it implies the availability of diverse, nutritious, and safe food for all. Reality often stands in stark contrast to this ideal. According to the World Health Organization, an estimated 600 million cases of foodborne disease occur each year worldwide, resulting in approximately 420 000 deaths. This means that almost one in ten people globally fall ill after consuming contaminated food, with children under five years of age bearing around 40% of the total disease burden[1]. Even in high-income regions, the challenge persists; the recent EFSA One Health 2024 Zoonoses Report highlights that the number of foodborne outbreaks in 2024 increased by 15% compared to 2023, and infections like listeriosis remain a severe and often deadly threat[2].

1 Havelaar, A. H., Kirk, M. D., Torgerson, P. R., Gibb, H. J., Hald, T., Lake, R. J., Praet, N., Bellinger, D. C., de Silva, N. R., Gargouri, N., Speybroeck, N., Cawthorne, A., Mathers, C., Stein, C., Angulo, F. J., Devleesschauwer, B., & World Health Organization Foodborne Disease Burden Epidemiology Reference Group, (2015). World Health Organization Global Estimates and Regional Comparisons of the Burden of Foodborne Disease in 2010. PLoS Medicine, 12(12), e1001923. https://doi.org/10.1371/journal.pmed.1001923

2 EFSA and ECDC (European Food Safety Authority and European Centre for Disease Prevention and Control), (2025). The European Union One Health 2024 Zoonoses Report. EFSA Journal, 23(12), e9759. https://doi.org/10.2903/j.efsa.2025.9759

In this challenging context, where the path from farm to fork is fraught with invisible hazards and where myths often travel faster than facts, the role of the university must transcend the walls of laboratories, amphitheatres, and classrooms. To truly serve, a university must be a living community, one that exists in, with, and for the communities that surround it.

For over 40 years, the Faculty of Biotechnology at Universidade Católica Portuguesa, in close articulation with its research centre, the CBQF (Centre for Biotechnology and Fine Chemistry), has embodied this mission. We view food safety not merely as a technical requirement, but as a communal pact. "If it is not safe, it is not food". This conviction drives a cycle of knowledge, service, and transformation that ripples through various layers of society.

A Community of Care

The university's role in community protection is perhaps most visible when public health is at risk. Decades ago, faced with a gap in national data, our researchers did not wait for official directives. We proactively coordinated with 25 hospitals to collect epidemiological data on listeriosis, creating a surveillance network where none existed. This initiative was not just about publishing papers; it was about protecting lives. By employing advanced molecular typing techniques, we helped identify the first listeriosis outbreak in Portugal, which had one of the highest mortality rates in the world (exceeding 30%), and traced the source of contamination to fresh cheese, working side-by-side with national health and food safety authorities.[3] This collaborative spirit turns scientific data into a public shield, proving that a research centre is a vital organ in the body of national health infrastructure.

A Community of Innovation

A community also depends on its economic vitality. Food safety is comprehensively addressed in our BSc and Master's programmes, ensuring that new graduates enter the workforce with a solid foundation in public health protection. Building on this academic training, our

3 Magalhães, R., Almeida, G., Ferreira, V., Santos, I., Silva, J., Mendes, M. M., Pita, J., Mariano, G., Mancio, I., Sousa, M. M., Farber, J., Pagotto, F., & Teixeira, P., (2015). Cheese-Related Listeriosis Outbreak, Portugal, March 2009 to February 2012. Euro Surveillance, 20(17), 21104. https://doi.org/10.2807/1560-7917.es2015.20.17.21104

Postgraduate Course in Food Safety, established more than 20 years ago, has played a key role in continuously updating the skills of senior professionals, transferring cutting-edge knowledge directly into the food industry. But our engagement goes deeper. We partner with companies to solve persistent problems, such as eliminating stubborn pathogens from processing environments or developing "clean label" antimicrobial solutions. By researching biological control strategies to replace chemical preservatives, we help the industry meet the consumer's demand for natural, safe, and sustainable products. This fosters a community of entrepreneurs who are equipped not just with business acumen, but with the scientific rigour necessary to ensure the safety and longevity of the food supply chain.

A Community of Learning

Perhaps the most profound impact of the university lies in its ability to translate complex science into daily habits. Knowledge is most powerful when it is accessible. Recognizing that foodborne illnesses disproportionately affect the vulnerable, we have taken science out of the classroom and into the homes of those who need it most.

We believe that education begins early, a philosophy driven by the project "*De pequenino se torce o pepino: lições de segurança alimentar para os mais novos*" (As the twig is bent, so grows the tree: food safety lessons for the young). Guided by the ancient proverb "I hear and I forget. I see and I remember. I do and I understand," this initiative prioritizes experimental science education. We bring hands-on laboratory activities to preschool and primary school children, allowing them to visualize the "invisible world" of microbes. By doing, they understand the basics of food safety, becoming ambassadors of hygiene within their own families. By instilling this mindset early, we are nurturing a generation that values evidence over superstition.

Simultaneously, we recognize that learning is a lifelong journey. Under the project "*É sempre tempo de aprender: lições de segurança alimentar para os mais velhos*" (It is always time to learn: food safety lessons for the elderly), our outreach campaigns target older demographics. We also focus on other vulnerable groups through projects like "*Listeriose: uma infeção grave mas fácil de prevenir*" (Listeriosis: a severe but preventable infection). Whether through television, radio, newspapers, or direct workshops, the goal is constant – to empower citizens with

science-based information, reducing the burden of illness and bridging the gap between the expert and the consumer.

A Shared Future

Despite global advancements, foodborne diseases remain a significant public health issue, with millions falling ill annually. Paradoxically, we face both food insecurity and significant food waste. Addressing these challenges requires a systemic approach where food safety is seen as an integral component of sustainability.

This is where the university finds its ultimate purpose. By generating robust science, training capable professionals, and educating an informed public, we act as a catalyst for a better community. We are not an ivory tower; we are a hub where researchers, industry leaders, healthcare professionals, and citizens meet. In this intersection, we find the "positive way to prospect our common life."

When a child washes their hands before a meal because of a school workshop, when a factory successfully eliminates a pathogen using a biological solution, or when an outbreak is stopped early due to rigorous surveillance, the university is fulfilling its promise. We are present. We are empowering. We are building a safer, healthier community, one discovery at a time.