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**Early View**

Review Article

# *Campylobacter* Species in Poultry Slaughterhouses: An Overview

**Key words**

*Campylobacter* species; poultry; slaughterhouses; foodborne diseases; food safety

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**Abstract:** *Campylobacter* is a constant concern in ensuring food safety, as it is one of the most common pathogens in food. The main source of *Campylobacter* species in food is poultry meat, and the primary production of this meat is a critical point where measures need to be taken to reduce its presence in the food chain. Therefore, poultry slaughterhouses are recognized as places where it is necessary to implement measures to control and reduce the number of *Campylobacter* spp. Food business operators are obliged to ensure greater hygiene on the slaughter line, through the inspection of equipment for each step of slaughter and the application of regular cleaning protocols. Continuous monitoring of the presence and abundance of *Campylobacter* spp. on the slaughter line provides data on the validity of hygiene control measures in the slaughterhouse, as well as the data needed to assess the microbiological risk in poultry meat. Monitoring the presence of *Campylobacter* spp. in poultry slaughterhouses is a basic activity that is necessary for taking measures to reduce contamination, improve microbiological safety in poultry processing and thus improve the food safety system as a whole. This review aims to highlight the importance of investigating the prevalence of *Campylobacter* spp. in poultry slaughterhouses, but also the importance of applying measures to prevent and control this pathogen both on farms and in slaughterhouses. These measures are necessary to minimize the presence and transmission of *Campylobacter* in poultry, thereby reducing the risk of foodborne diseases.

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## Introduction

*Campylobacter* species is a commensal, enteric bacteria that causes campylobacteriosis, the most commonly reported foodborne zoonosis in the European Union (EU)/European Economic Area (EEA) region since 2005 (1). As zoonotic infection that is the leading intestinal infection in humans worldwide (2), campylobacteriosis represents a serious public health problem. Poultry meat, especially raw, undercooked and recontaminated poultry meat or meat products, is the most common source of *Campylobacter* spp. in food (3). Although a microaerophilic bacterium, *Campylobacter* also manages to survive in aerobic conditions. (4). Surviving the presence of oxygen, as well as other stresses, such as osmotic stress and high temperature, *Campylobacter* spp. remains widespread throughout the poultry production chain, all the way to fresh meat at retail (5). Its presence in the human intestine is a consequence of consuming contaminated food, such as, undercooked poultry, but also unpasteurized dairy products and/or contaminated water. Therefore, controlling the presence and elimination of *Campylobacter* species from agroecosystems is an important task of the food safety system (6).

Broilers are the dominant poultry for food production and most food safety research is conducted on them. Starting with farm animals, then through the entire agri-food system, this pathogen travels to the final consumer, mainly thanks to poor hygienic production practices. National competent authorities, respecting European regulations, seek to establish monitoring plans on the slaughter line, since the highest prevalence of *Campylobacter* spp. is found in poultry carcasses (7, 8). Although animals are usually infected with *Campylobacter* species at the farm level, the slaughter process is considered an important factor in re- and cross-contamination (5). During 2008, a basic survey was conducted at the EU level (9), covering 26 member states, in broiler slaughterhouses to determine the prevalence of *Campylobacter* spp. in broiler carcasses. The prevalence of *Campylobacter* spp. on broiler carcasses in individual Member States ranged from 4.9% to 100% (9). In addition to whether *Campylobacter* spp. is present on broilers during slaughter, it is also important in what number it is present per gram of neck skin or per cm$^2$ of broiler carcass. Handling of contaminated poultry in the process of its processing and food production is the main route of *Campylobacter* infection (10). The high prevalence of these bacteria on broiler carcasses poses a risk to public health. Therefore, studies to identify *Campylobacter* spp. and determine its abundance on broiler carcasses, but also on the skin in the neck area, which has been identified as a critical point in *Campylobacter* contamination, are important for assessing the risk of infection for consumers (11). Numerous measures have been prescribed for the control and prevention of *Campylobacter* spp. in poultry, starting at the farm level, then in the slaughterhouse and in the poultry processing sector. However, despite their use, *Campylobacter* remains a constant threat to food safety.

## Source and prevalence of *Campylobacter* spp. in poultry meat

*Campylobacter* spp. has been reported in both domestic and wild birds, especially commercial poultry (13). High population density is cited as one of the reasons for its widespread presence on poultry farms (14). In addition to this, there are various other factors that contribute to the widespread distribution of *Campylobacter* spp. in commercial poultry farms, such as the type of farming, housing systems and farm biosecurity standards (15). This bacterium is most commonly transmitted horizontally within the flock. Numerous epidemiological studies on the origin of *Campylobacter* in poultry have cited possible sources such as: insects (16), rodents (17), wild birds (18), other livestock farms and residual *Campylobacter* spp. populations from previous flocks (19). In addition, the environment of poultry farms, such as soil, water sources, dust, surfaces and air, is very often a source of this pathogen (20, 21). Poor biosecurity and hygiene standards in the poultry house are the most common reasons for the presence of *Campylobacter* species in poultry (22). Bailey et al. report a possible increased risk of contamination of poultry on the farm due to poor disinfection of drinking water and lack of adequate pest control treatments on poultry farms (23). Some other on-farm risk factors include waste reuse practices, time of year, general conditions on broiler farms, and age of broilers (24, 25). Due to the presence of numerous on-farm sources of *Campylobacter* spp. and the numerous risks of contamination, preharvest *Campylobacter* spp. control research has mainly focused on management practices (biosecurity and hygiene measures) and nutritional strategies that either prevent bacterial colonization or reduce their concentration in the gut of broilers (26). However, despite the implementation of such strategies, broilers from colonized flocks enter the slaughter process with high levels of *Campylobacter* bacteria on their feathers, most often due to contact with dirt and feces in the poultry house, as well as re-contamination during transport (27). There are numerous steps that each broiler carcass goes through in the slaughterhouse, and the most important processing steps for re-/cross-contamination of carcasses are plucking and evisceration (28). These steps are supplemented by scalding and plucking, practices known to increase the spread of foodborne pathogens (29). Scalding involves immersing the carcasses in hot water to open the feather follicles and allow for easy removal of the feathers during the harvesting process. The plucking phase occurs before the evisceration phase and involves the removal of the feathers and the upper layer of integument (30). Although it would be expected that *Campylobacter* spp. numbers would decrease after scalding, this process has not been proven to have any effect on reducing its abundance on broiler carcasses (31). Possible reasons for this include the fact that *Campylobacter* spp. are particularly well adapted to living on the skin of broilers, where they can form organic biofilms, and the fact that the temperature in the subcutaneous tissue is often 3°C to 4°C lower than the scalding temperature (32). Regarding the evisceration process, it is a step in which cross-contamination with *Campylobacter* spp. can significantly increase due to disruption of internal organs and stomach contents (33). Situations such as the spread of contamination from work equipment, from the environment, from the contents of injured internal organs are just some of the sources of contamination in this area of poultry carcass processing. Defecation also occurs in parallel with this step, which, if inadequately carried out, results in a high risk of contamination of broiler carcasses and slaughter equipment (34). Scientific evidence on the impact of these slaughterhouse processes on *Campylobacter* spp. abundance on carcasses is inconsistent. While some have observed an increase in the number of this pathogen during and after these steps (35), other authors have reported a decrease (19) or a complete absence of difference in the number of *Campylobacter* bacteria after evisceration (36, 37). In processing plants, different systems are used for cooling carcasses. One of the frequently used systems is cold water. Meat immersed in cold water has a significantly lower number of *Campylobacter* spp. than meat cooled in air (38). A study conducted in 20 US processing plants showed that the use of chlorine in the chilling tank significantly reduced the amount of *Campylobacter*, but did not completely eliminate the bacteria (39), making this carcass processing step a source of cross-contamination (40). It should be noted that chlorine-based rinses and similar antimicrobial agents are not approved for use on poultry carcasses in the European Union under Regulation (EC) No. 853/2004. Most other European countries, especially CEFTA countries, prohibit the use of these agents on poultry carcasses, while this is not the case in certain non-EU countries, such as the United States. In facilities that use cold air to chill carcasses, it has been shown to have either no microbiological effects (40) or only minor effects (23) on *Campylobacter* levels. Close contact between carcasses and equipment also contributes to the spread of contamination, as it results in the accumulation of tissue fragments containing *Campylobacter* spp., which in turn contaminate subsequent carcasses (29). Furthermore, the risk of cross-contamination increases when carcasses are handled during processing and storage (41). Slaughterhouse workers and the equipment they use are a constant source of *Campylobacter* spp. contamination in slaughterhouses (42, 31).

Aerosols and droplets generated by excessive washing during the hanging, scalding, and evisceration stages of slaughter can also contribute to the spread of the disease (43).

## Prevention and control of *Campylobacter* spp. in poultry chain

The ability of *Campylobacter* spp. to colonize avian species (e.g., chickens, turkeys, starlings, quail, crows, and ducks) and domestic livestock (e.g., pigs, sheep, cattle, and goats) contributes to its spread among different animal species (44). Although domestic mammals and environmental contamination can be sources of infection, the main source of *Campylobacter* infection in humans is poultry products contaminated with this microbe (45). *Campylobacter jejuni* and *Campylobacter coli* are the most commonly isolated species in cases of human campylobacteriosis (46). Chicken has been identified as the main source of this foodborne pathogen, with the slaughter process as the step that contributes most to the contamination of chicken carcasses. In particular, the contamination of chicken carcasses with intestinal contents of Campylobacter-infected chickens during processing in slaughterhouses is the riskiest step in the entire process (47). Therefore, general disease control strategies have been introduced that include pre-harvest and post-harvest intervention control points. Pre-harvest control points include (I) implementation of biosecurity measures to reduce exposure to *Campylobacter* spp. from the environment, (II) vaccination of poultry, and (III) use of alternative antibiotic products to reduce or eliminate infection in chickens, such as: prebiotics, probiotics, essential oils, bacteriophages, etc. Post-harvest control points include (I) implementation of carcass sanitation methods in slaughterhouses, (II) the use of permitted methods for decontamination of carcasses, and (III) implementation of eggshell sanitation methods (47). Implementation of all these strategies and other control measures is necessary to reduce the burden of *Campylobacter* spp. on chicken carcasses, and thus the risk of its transmission from poultry products to humans.

On-farm biosecurity measures are part of pre-harvest measures and include, among others: (a) providing sufficient space for chickens on farms to reduce contact between them and thus possible horizontal transmission of *Campylobacter* spp.; (b) continuous sanitation of the environment on and around the farm to reduce the presence or elimination of *Campylobacter* spp. on farms; (c) strict control and application of biosecurity measures when it comes to human activities on the farm by eliminating or minimizing the transmission of *Campylobacter* spp. from the external environment via contaminated clothing, leather and boots of farm workers (46).

In addition to the application of biosecurity measures on farms, vaccination is one of the strategies applied to reduce the presence of *Campylobacter* spp. with poultry on farms. The presence of maternal antibodies in chicks up to 14 days old supports the application of this measure (48). But after this period of passive immunity, chickens become susceptible to infection, especially in cases where *Campylobacter* spp. is present in older flocks and the environment. Post-infection immune responses do not appear to limit *Campylobacter* spp. colonization until the age of broiler slaughter (46). Numerous techniques have been used in the development of effective vaccines, such as: whole cell or subunit vaccination, microorganism-vectored vaccines, and nanoparticle vaccines. However, despite attempts over the past decades to develop a successful vaccine against *Campylobacter* spp. in broilers, successful commercial vaccines are currently not available (49).

Another strategy implemented with the intention of reducing *Campylobacter* spp. colonization in broilers and ultimately reducing its presence on broiler carcasses is the use of feed additives. Given the efforts to minimize the use of antibiotics as growth promoters in poultry production, alternative strategies are being used to compensate for their effects. Therefore, prebiotics, probiotics, essential oils, bacteriophages and other alternative antibiotic products are added to poultry feed (46). Despite studies showing a small effect of prebiotics in reducing *Campylobacter* spp. in the gastrointestinal tract of poultry (50,51), their supplementation continues largely due to the knowledge that these indigestible fibers have a beneficial effect on the gut microbiota. The use of probiotics in poultry feed has been shown to protect farmed poultry from *Campylobacter* infection (52). These beneficial microorganisms are used as an antimicrobial alternative to antibiotics in poultry feed. They exert their antimicrobial effects by competing with microbial pathogens for adhesion and colonization sites and by modulating intestinal immune responses and microbiome composition (53). In addition, probiotic bacteria produce antimicrobial substances, such as bacteriocins, lactic acid, and hydrogen peroxide, which have direct bactericidal activity against enteric pathogens (53,54). Different *Lactobacillus* species have been shown to exert immunomodulatory and anti-campylobacter effects (52). The presence of different *Lactobacillus* species in the intestines of poultry results in inhibition of *Campylobacter* invasion in cultured intestinal epithelial cells and a reduction in the expression of *C. jejuni* virulence genes. In addition, *Lactobacillus* species have shown the potential to enhance the phagocytic activity of chicken macrophages and modulate their immune responses (52). Although many studies support the role of probiotics in providing protection against *Campylobacter* infection, the results of these studies are largely heterogeneous. It is unclear whether the inconsistencies in probiotic efficacy are due to strain-specific effects and/or are related to differences in age and species of birds, dose and combinations of probiotics, route of administration, frequency and duration of application, and other environmental and management factors, including housing type and feeding regimen (55). In addition to prebiotics and probiotics, essential oils, organic acids, small molecule inhibitors, short-chain fatty acids, and bacteriophages are added to poultry feed. These additives have individual or symbiotic antibiotic effects in the poultry gut (46).

In addition to on-farm control measures, sanitation practices should be implemented in poultry processing facilities to further reduce *Campylobacter* levels along the food chain. Research on the control of *Campylobacter* spp. in broilers in primary production confirms that the proportion of broiler flocks infected with *Campylobacter* is directly related to the prevalence of *Campylobacter* spp. on broiler carcasses (4.9% to 100%) (56). *Campylobacter* spp. content in the caecum of chickens before slaughter reaches approximately 8 $\log_{10}$ CFU/g, and contamination of chicken feathers with faecal material during transport to the slaughterhouse can also be a significant external source of carcass contamination during the plucking/feathering process (57).

Given the poor tolerance of *Campylobacter* spp. to conditions outside the gastrointestinal tract, increasing the dwell time in cages between flocks and effective cleaning are suggested as options to reduce the risk of horizontal exposure (58). Effective carcass decontamination practices are another step in reducing the concentration of *Campylobacter* spp. in poultry meat. Contamination of meat products with intestinal contents is difficult to prevent during processing in slaughterhouses due to the high number of *Campylobacter* spp. in the intestines and the high percentage of infected broilers (46). Since chicken meat is recognized as the main cause of the most common foodborne zoonosis, studies on the presence of *Campylobacter* in fresh chicken meat at retail are frequent and numerous. They have shown that contamination is common, ranging from 59.9% of chicken meat samples from retail establishments (59). To reduce the burden of *Campylobacter* spp. on poultry carcasses, physical, chemical and biological control measures are taken on production lines.

European Food Safety Authority has recommended a series of control measures as part of the Process Hygiene Criteria (PHC) for *Campylobacter* spp. in accordance with Regulation (EU) No 2017/1495 (12). The purpose of the PHC is to ensure, through their mandatory and regular application, constant control of *Campylobacter* spp. on the slaughter line and thus ensure safe poultry meat (3). The treatment of carcasses at the end of the processing line is highlighted as significant, since in addition to the risk of carcass contamination during evisceration, cross-contamination from processing equipment, due to insufficient cleaning and disinfection, is considered another source of contamination during the slaughter process. Therefore, the use of previously proven safe physical and biological methods for carcass decontamination is considered potentially beneficial for food safety later at a later stage of the food chain. (46). In order to find safe and effective disinfectants on the slaughter line, the use of organic acids and quaternary ammonium compounds was experimentally tested. (60). Effective and safe agents for treating poultry carcasses to reduce *Campylobacter* infection are: agents with 2% lactic acid, then sodium chlorite (1200 mg/L) and trisodium phosphate (10-12%; pH 12) (61). The modest efficacy of these agents was not sufficient to justify their use in the treatment of poultry carcasses in the European Union countries. Therefore, the use of sodium chlorite and trisodium phosphate is not approved for use on poultry carcasses at all, and the use of lactic acid is only approved for the decontamination of bovine carcasses in accordance with Commission Regulation (EU) No. 101/2013. The slaughter phase is also the optimal point in the production cycle for decontamination using UV light and high temperatures, which have the potential for very high levels of efficiency if successfully implemented in slaughterhouses (62). However, the main disadvantage of these effective decontamination methods is their impact on the sensory properties of the meat. Freeze-thaw cycles, irradiation and pre-cooked meat are unfavorable and undesirable qualities for consumers in terms of sensory properties and overall food perception (63). In addition to chemical and physical control measures, biological treatments of broiler carcasses using essential oils, bacteriophages, bacteriocins and probiotics are also being applied. Data on the effectiveness of these methods in reducing *Campylobacter* spp. numbers after harvest are scarce, but based on their effects on other foodborne pathogens, their potential for controlling *Campylobacter* spp. in food is highlighted (64, 65).

## Food safety and public health significance

Recognizing slaughterhouses as a risk point for contamination, many European countries have implemented a surveillance system for *Campylobacter* spp. in the broiler meat chain, which aims to reduce the contamination of broiler carcasses at the slaughter line. However, only a few European countries also take measures to reduce and control the spread of *Campylobacter* spp. in broiler flocks (66). According to the current legislation, each EU/EEA Member State is responsible for carrying out *Campylobacter* spp. surveillance, which includes the collection, analysis and interpretation of data (67). In addition, surveillance includes control measures taken to mitigate the negative consequences of the pathogen in the food chain, which help to control and prevent the transmission of pathogens. The introduction of mandatory campylobacter surveillance (68, 12) was based on the scientific opinion of EFSA which estimated that broiler meat alone accounted for 20–30% of human campylobacteriosis cases. This scientific opinion highlights the fact that these cases of human campylobacteriosis could be reduced by >50% or even >90%, if the microbiological criteria in all slaughter batches tested on neck and breast skin were set at a critical limit of 1000 or 500 colony-forming units per gram (CFU/g) (3). Mandatory monitoring of *Campylobacter* spp. in poultry slaughterhouses is based on Process Hygiene Criteria (PHC) and includes quantification of *Campylobacter* spp. on neck skin samples. According to the established slaughter hygiene criteria, a limit threshold of acceptable carcass contamination (<1,000 CFU/g) was set (12). Subjects in the food sector, respecting the obligation to conduct surveillance tests weekly, assess the success of the slaughter process. The information obtained over time, helping to identify trends, variations and problems, provides the basis for decision-making and corrective action to maintain control within established limits. The acceptance criteria, valid until January 1, 2025, stated that the hygiene of the slaughter process was considered satisfactory if a maximum of 15 out of 50 samples (30%) did not exceed 1,000 CFU/g of neck skin for *Campylobacter* spp. As of January 1, 2025, this criterion has been tightened, so that a maximum of 10 out of 50 samples can exceed the limit value of 1000 CFU/g of Campylobacter (12). The regulations require interventions to effectively manage and reduce the microbial load on carcasses, ensuring food safety and regulatory compliance (68).

Tracking the source of the pathogen and its prevalence in poultry meat would facilitate better understanding and development of interventions from management practices and feeding regimens to further reducing the risk of contamination before entering the processing plant. The broiler sector has undergone dramatic changes in recent years, moving from conventional production to antibiotic-free programs, implementing biosecurity practices, changing broiler feeding strategies, and influencing their genetics (26). These and numerous other strategies (nutritional, vaccines, competitive inhibition, or biosecurity practices), at the pre- and post-slaughter level, are applied to reduce the presence of *Campylobacter* spp. in food and thus contribute to the protection of public health and the reduction of treatment costs. *Campylobacter*, along with *Salmonella*, causes the largest number of foodborne illnesses. Data from the United States show that their incidence contributes to approximately 70.7% of foodborne infections, 71.6% of hospitalizations, and 59% of deaths from foodborne illnesses (69). In the European Union, campylobacteriosis has been the most commonly reported food-borne gastrointestinal infection in humans since 2005. EFSA reports that in 2023 there were 148,181 confirmed cases of human campylobacteriosis in EU countries, corresponding to a European Union notification rate of 45.7 cases per 100,000 population (68). The same source states that the overall trend for *Campylobacter* human infections did not show a statistically significant increase or decrease overthe 2019–2023 period. In 5 member states, fresh broiler and turkey meat shows the highest percentages of contamination, 21.6% and 19.4%, respectively (68).

Campylobacteriosis is mostly caused by *C. jejuni*. Most people infected with campylobacteriosis either show no symptoms or only moderate symptoms, including diarrhea (which may or may not be bloody), nausea, fever, and abdominal pain (70). Some of the more serious complications that can occur due to *Campylobacter* infection include: pancreatitis, peritonitis, bacteremia, reactive arthritis, and Guillain-Barré syndrome (71). For these cases of complications with long-term consequences caused by *Campylobacter* infection, the precise mechanism is not clear. The estimated incidence of campylobacteriosis in the United States is 14 cases per 100,000 people (72). The actual incidence of campylobacteriosis is estimated at 9 million cases per year in Europe due to the asymptomatic nature of the disease (25). Campylobacteriosis cases are most common in July and August, coinciding with the peak season for *Campylobacter* isolation from chickens and other poultry in industrialized countries (73). There is no consensus on the infective dose, but it has been reported that a dose of 500 *C. jejuni* cells is sufficient to cause diarrhea and abdominal pain, and clinical symptoms can occur with exposure to a dose of 800 to $10^5$ of *C. jejuni* cells (25). Control measures in the food production include numerous activities performed at different stages, and one of them is the education of producers, resulting in the improvement of biological security on farms and general purity of agricultural holdings and processing plants (74). The education of the population in safe practices for food management and preparation is also one of the measures in ensuring safe food and public health. Waganaar et al. have announced that after the application of the education strategy in Iceland, the number of cases of campilobacteriosis fell by 72% (75). Bearing in mind that cases of campilobacteriosis often occur when raw poultry is improperly handled in home cuisine (76), permanent population education is desirable.

## One Health approach to prevention, treatment and control of campylobacteriosis

In the control and prevention of foodborne diseases, the concept of "One Health" seems to be effective, as there are joint efforts aimed at improving health between the human health, animal health and food safety sectors (77). Today, this concept is implemented in national action plans for the control and prevention of foodborne diseases (78), where surveillance is based on risk and appropriate control actions. Surveillance and risk-based control actions can be set according to different levels of risk in different segments of the population of interest. Thus, for example, surveillance can be risk-based, with priority given to segments of the population that are at higher risk of: exposure, infection, impact, transmission of infection or other consequences (79). Similarly, control actions can be more effective in mitigating the risk of foodborne diseases in humans if they are targeted at individual levels of production, starting from livestock farming, agricultural operations and ending with the production and management of the food product (78).

In the context of public health, increasing attention has been paid to the ability of campylobacteriosis to cause relapses, as well as the spread of antimicrobial resistance (80). The increase in industrial poultry production, as well as the widespread use of antibiotics in animals during their fattening, but also in humans, has led to the emergence and spread of a new threat from antibiotic-resistant *Campylobacter* species. *Campylobacter* spp. can cause severe or systemic infections in immunocompromised or young/elderly patients. Treatment of such conditions often requires antibiotic therapy with first-line antibiotics, including fluoroquinolones and macrolides. Over time, *Campylobacter* spp. has acquired resistance to these clinically important antibiotics, compromising the effectiveness of antibiotic treatment. To address the problem of antimicrobial resistance, research and development of new and alternative measures for the control of antibiotic-resistant *Campylobacter* spp. in animal reservoirs and human hosts have been conducted. Special attention is being paid to the development of new alternative approaches to combat this pathogen (81). Therefore, several strategies have been evaluated to date for the control of *Campylobacter* infections in animal reservoirs and in humans, but none of the alternative approaches have yielded results that are as effective as antibiotic therapy (82, 83). For antibiotic therapy in humans, the use of alternative antibiotics is being considered, as well as the development and use of antibiotic adjuvants that can improve the usefulness of existing antibiotics. New clinical studies are needed for these approaches. Regarding vaccines, some of them have shown good protective effects in experimental animal models, but have not been able to produce protective immunity in human clinical trials (84). Such research results have led to the conclusion that host specificity plays an important role in immunization with *Campylobacter* vaccines and will certainly lead to different approaches for future vaccine development. In addition to activities within the framework of human health protection, a significant amount of research has been carried out in the animal health sector, all with the aim of mitigating *Campylobacter* spp. colonization in animal reservoirs. This is particularly true for poultry. In this segment, some approaches, such as the use of N-glycan-based vaccines, bacterial and phage therapies, have shown encouraging results (85), while others (e.g. prebiotics and probiotics) have achieved limited success because their effects are modest and highly variable (44, 86). In addition, when it comes to domestic livestock farming, it is necessary to take into account economic factors and the cost-effectiveness of using alternative methods (81). All these issues complicate the situation, and a combination of several approaches may be necessary to achieve optimal outcomes in the control of *Campylobacter* spp. in the food chain, which is why the "One Health" approach is considered potentially effective and efficient.

## Conclusion

*Campylobacter* spp. is a persistent and widespread foodborne pathogen. Its prevalence in the food chain is most evident in fresh poultry meat and poultry products. Therefore, pre- and post-mortem measurements of poultry are a constant topic of attention from a food safety perspective. With continued research, an integrated approach of health, veterinary and food safety systems, through the “One Health” concept, seems to be a good solution for building a system for the control and monitoring of *Campylobacter* spp. along the entire food chain.

## References


1. European Food Safety Authority, European Centre for Disease Prevention and Control. The European union one health 2021 zoonoses report. EFSA J 2022;20(12):e07666. doi: 10.2903/j.efsa.2022.7666

2. Epps SVR, Harvey RB, Hume ME, Phillips TD, Anderson RC, Nisbet DJ. Foodborne Campylobacter: infections, metabolism, pathogenesis and reservoirs. Int J Environ Res Public Health 2013;10(12):6292–304. doi: 10.3390/ijerph10126292

3. EFSA Panel on Biological Hazards (BIOHAZ). Scientific opinion on Campylobacter in broiler meat production: control options and performance objectives and/or targets at different stages of the food chain. EFSA J 2011; 9(4): 2105. doi:10.2903/j.efsa.2011.2105

4. Nastasijevic I, Proscia F, Boskovic M, et al. The European Union control strategy for *Campylobacter spp*. in the broiler meat chain. J Food Saf 2020;40(5): e12819. doi: 10.1111/jfs.12819

5. Beterams A, Püning C, Wyink B, Grosse-Kleimann J, Gölz G, Schönknecht A, et al. Status quo: Levels of *Campylobacter spp.* and hygiene indicators in German slaughterhouses for broiler and turkey. Int J Food Microbiol 2024; 414: 110610. doi: 10.1016/j.ijfoodmicro.2024.110610

6. Zhang J, Konkel ME, Gölz G, Lu X. Editorial: Campylobacter-associated food safety. Front Microbiol 2022;13: 1038128. doi: 10.3389/fmicb.2022.1038128

7. Szosland-Fałtyn A, Bartodziejska B, Królasik J, Paziak-Domańska B, Korsak D, Chmiela M. The Prevalence of *Campylobacter spp*. in polish poultry meat. Pol J Microbiol 2018; 67(1): 117–20. doi: 10.5604/01.3001.0011.6152

8. EFSA Panel on Biological Hazards (BIOHAZ), EFSA Panel on contaminants in the food chain (CONTAM) and EFSA Panel on Animal Health and Welfare (AHAW). Scientific Opinion on the public health hazards to be covered by inspection of meat (poultry). EFSA J 2012; 10(6): 2741. doi: 10.2903/j.efsa.2012.2741

9. European Food Safety Authority. Analysis of the baseline survey on the prevalence of Campylobacter in broiler batches and of *Campylobacter* and *Salmonella* on broiler carcasses in the EU, 2008 - Part A: *Campylobacter* and *Salmonella* prevalence estimates. EFSA J 2010; 8(3): 1503. doi: 10.2903/j.efsa.2010.1503

10. Tresse O, Alvarez-Ordóñez A, Connerton IF. Editorial: about the foodborne pathogen *Campylobacter.* Front Microbiol 2017; 8: 1908. doi: 10.3389/fmicb.2017.01908

11. Wieczorek K, Kania I, Osek J. Prevalence and antimicrobial resistance of *Campylobacter spp*. isolated from poultry carcasses in Poland. J Food Prot 2013; 76(8): 1451–5. doi: 10.4315/0362-028X.JFP-13-035

12. Commission Regulation (EU) 2017/1495 of 23 August 2017 amending Regulation (EC) No 2073/2005 as regards *Campylobacter* in broiler carcases. 2017 Aug 23. Off J Eur Union 2017; 60: L218/1.

13. Sadek SAS, Shaapan RM, Barakat AMA. Campylobacteriosis in poultry: a review. J World’s Poult Res 2023; 13(2): 168–79. doi: 10.36380/jwpr.2023.19

14. Casalino G, D’Amico F, Dinardo FR, et al. Prevalence and antimicrobial resistance of *Campylobacter jejuni* and *Campylobacter coli* in wild birds from a Wildlife Rescue Centre. Animals (Basel) 2022; 12(20): 2889. doi: 10.3390/ani12202889

15. Nakhaee P, Mohamad Hafez H. A review on significance of public health issues related to poultry campylobacteriosis. J Poult Sci Avian Dis 2023;1(1):52–66. doi: 10.61838/kman.jpsad.1.1.6

16. Dale EL, Nolan SP, Berghaus RD, Hofacre CL. On farm prevention of Campylobacter and Salmonella: lessons learned from basic biosecurity interventions. J Appl Poult Res 2015; 24: 222–32.

17. Gorain C, Singh A, Bhattacharyya S, et al. Mucosal delivery of live *Lactococcus lactis* expressing functionally active JlpA antigen induces potent local immune response and prevent enteric colonization of *Campylobacter jejuni* in chickens. Vaccine 2020; 38(7): 1630–42. doi: 10.1016/j.vaccine.2019.12.064

18. Hald B, Skov MN, Nielsen EM, et al. *Campylobacter jejuni* and *Campylobacter coli* in wild birds on Danish livestock farms. Acta Vet Scand 2016; 58(1): 11. doi: 10.1186/s13028-016-0192-9

19. Taha-Abdelaziz K, Hodgins DC, Alkie TN, et al. Oral administration of PLGA-encapsulated CpG ODN and *Campylobacter jejuni* lysate reduces cecal colonization by *Campylobacter jejuni* in chickens. Vaccine 2018; 36(3): 388–94. doi: 10.1016/j.vaccine.2017.11.073

20. Wu Z, Sahin O, Zhang Q. Campylobacter. In: Prescott JF, eds. Pathogenesis of bacterial infections in animals. Hoboken: John Wiley & Sons, 2022: 393-412. 2022.

21. Zhang Q, Sahin O. Campylobacteriosis. In: Swayne DE, eds.Diseases of poultry. Hoboken: John Wiley & Sons, 2020: 754-69.

22. Natsos G, Mouttotou NK, Ahmad S, Kamran Z, Ioannidis A, Koutoulis KC. The genus *Campylobacter*: detection and isolation methods, species identification & typing techniques. J Hell Vet Med Soc 2019; 70(1): 1327. doi: 10.12681/jhvms.20337

23. Bailey MA, Taylor RM, Brar JS, et al. Prevalence and antimicrobial resistance of *Campylobacte*r from antibiotic-free broilers during organic and conventional processing. Poult Sci 2019; 98(3): 1447–54. doi: 10.3382/ps/pey486

24. Chowdhury S, Sandberg M, Themudo GE, Ersbøll AK. Risk factors for Campylobacter infection in Danish broiler chickens. Poult Sci 2012; 91(10): 2701–9. doi: 10.3382/ps.2012-02412

25. El-Saadony MT, Saad AM, Yang T, et al. Avian campylobacteriosis, prevalence, sources, hazards, antibiotic resistance, poultry meat contamination, and control measures: a comprehensive review. Poult Sci 2023; 102(9): 102786. doi: 10.1016/j.psj.2023.102786

26. Wang J, Vaddu S, Bhumanapalli S, et al. A systematic review and meta-analysis of the sources of *Campylobacter* in poultry production (preharvest) and their relative contributions to the microbial risk of poultry meat. Poult Sci 2023; 102(10): 102905. doi: 10.1016/j.psj.2023.102905

27. Rasschaert G, De Zutter L, Herman L, Heyndrickx M. *Campylobacter* contamination of broilers: the role of transport and slaughterhouse. Int J Food Microbiol 2020; 322(108564): 108564. doi: 10.1016/j.ijfoodmicro.2020.108564

28. Perez-Arnedo I, Gonzalez-Fandos E. Prevalence of *Campylobacter spp.* In poultry in three Spanish farms, a slaughterhouse and a further processing plant. Foods 2019;8(3): 111. doi: 10.3390/foods8030111

29. Nothaft H, Perez-Muñoz ME, Yang T, Murugan AVM, Miller M, Kolarich D, et al. Improving chicken responses to glycoconjugate vaccination against *Campylobacter jejuni*. Front Microbiol 2021; 12: 734526. doi: 10.3389/fmicb.2021.734526

30. Compliance guideline for controlling salmonella and campylobacter in poultry . 2nd ed. Washington: Department of Agriculture (USDA)-Food Safety and Inspection Service (FSIS), 2008.

31. Ellerbroek LI, Lienau J-A, Klein G. *Campylobacter spp*. in broiler flocks at farm level and the potential for cross-contamination during slaughter: *Campylobacter* in broiler flocks and during slaughter. Zoonoses Public Health 2010; 57(7/8): e81-8. doi: 10.1111/j.1863-2378.2009.01267.x

32. Yang H, Li Y, Johnson MG. Survival and death of *Salmonella typhimurium* and *Campylobacter jejuni* in processing water and on chicken skin during poultry scalding and chilling. J Food Prot 2001; 64(6): 770–6. doi: 10.4315/0362-028x-64.6.770

33. Pinto da Rosa P, Pio Ávila B, Damé Veber Angelo I, et al. Impact of different chicken meat production systems on consumers' purchase perception. Br Poult Sci 2021; 62(3): 387–95. doi: 10.1080/00071668.2020.1857335

34. Mendes ÂJ, Santos-Ferreira NL, Costa FM, et al. External contamination of broilers by *Campylobacter spp.* increases from the farm to the slaughterhouse. Br Poult Sci 2020; 61(4): 400–7. doi: 10.1080/00071668.2020.1736264

35. Rosenquist H, Sommer HM, Nielsen NL, Christensen BB. The effect of slaughter operations on the contamination of chicken carcasses with thermotolerant *Campylobacter*. Int J Food Microbiol 2006; 108(2): 226–32. doi: 10.1016/j.ijfoodmicro.2005.12.007

36. Berrang ME, Dickens JA. Presence and level of Campylobacter spp. On broiler carcasses throughout the processing plant. J Appl Poult Res 2000; 9(1): 43–7. doi: 10.1093/japr/9.1.43

37. Zhang X, Peng Z, Li P, Mao Y, Shen R, Tao R, et al. Complex internal microstructure of feather follicles on chicken skin promotes the bacterial cross-contamination of carcasses during the slaughtering process. Front Microbiol 2020; 11: 571913. doi: 10.3389/fmicb.2020.571913

38. Lee S-K, Park H-J, Lee , et al. Distribution and molecular characterization of Campylobacter species at different processing stages in two poultry processing plants. Foodborne Pathog Dis 2017; 14(3): 141–7. doi: 10.1089/fpd.2016.2218

39. Berrang ME, Bailey JS, Altekruse SF, et al. Prevalence and numbers of *Campylobacter* on broiler carcasses collected at rehang and postchill in 20 U.S. processing plants. J Food Prot 2007; 70(7): 1556–60. doi: 10.4315/0362-028x-70.7.1556

40. Vandeputte J, Martel A, Van Rysselberghe N, et al. In ovo vaccination of broilers against *Campylobacter jejuni* using a bacterin and subunit vaccine. Poult Sci 2019; 98(11): 5999–6004. doi: 10.3382/ps/pez402

41. Zhong X, Wu Q, Zhang J, et al. *Campylobacter jejuni* biofilm formation under aerobic conditions and inhibition by ZnO nanoparticles. Front Microbiol 2020; 11: 207. doi: 10.3389/fmicb.2020.00207

42. Myintzaw P, Moran F, Jaiswal AK. Campylobacteriosis, consumer's risk perception, and knowledge associated with domestic poultry handling in Ireland. J Food Saf 2020; 40(4): e12799. doi: 10.1111/jfs.12799

43. Peyrat MB, Soumet C, Maris P, Sanders P. Recovery of *Campylobacter jejuni* from surfaces of poultry slaughterhouses after cleaning and disinfection procedures: analysis of a potential source of carcass contamination. Int J Food Microbiol 2008; 124(2): 188–94. doi: 10.1016/j.ijfoodmicro.2008.03.030

44. Johnson TJ, Shank JM, Johnson JG. Current and potential treatments for reducing Campylobacter colonization in animal hosts and disease in humans. Front Microbiol 2017; 8: 487. doi: 10.3389/fmicb.2017.00487

45. Hailu W, Helmy YA, Carney-Knisely G, Kauffman M, Fraga D, Rajashekara G. Prevalence and antimicrobial resistance profiles of foodborne pathogens isolated from dairy cattle and poultry manure amended farms in Northeastern Ohio, the United States. Antibiotics (Basel) 2021; 10(12): 1450. doi: 10.3390/antibiotics10121450

46. Taha-Abdelaziz K, Singh M, Sharif S, et al. Intervention strategies to control *Campylobacter* at different stages of the food chain. Microorganisms 2023; 11(1): 113. doi: 10.3390/microorganisms11010113

47. Newell DG, Elvers KT, Dopfer D, et al. Biosecurity-based interventions and strategies to reduce *Campylobacter spp*. on poultry farms. Appl Environ Microbiol 2011; 77(24): 8605–14. doi: 10.1128/AEM.01090-10

48. Cawthraw SA, Newell DG. Investigation of the presence and protective effects of maternal antibodies against *Campylobacter jejuni* in chickens. Avian Dis 2010; 54(1): 86–93. doi: 10.1637/9004-072709-Reg.1

49. Silva J, Leite D, Fernandes M, Mena C, Gibbs PA, Teixeira P. *Campylobacter spp*. as a foodborne pathogen: a review. Front Microbiol 2011; 2: 200. doi: 10.3389/fmicb.2011.00200

50. Froebel LK, Jalukar S, Lavergne TA, Lee JT, Duong T. Administration of dietary prebiotics improves growth performance and reduces pathogen colonization in broiler chickens. Poult Sci 2019; 98(12): 6668–76. doi: 10.3382/ps/pez537

51. Chen TC. Effect of adding chicory fructans in feed on fecal and intestinal microflora and excreta volatile ammonia. Int J Poult Sci 2003; 2: 188–94. doi: 10.3923/ijps.2003.188.194

52. Taha-Abdelaziz K, Astill J, Kulkarni RR, et al. In vitro assessment of immunomodulatory and anti-Campylobacter activities of probiotic lactobacilli. Sci Rep 2019; 9(1): 17903. doi: 10.1038/s41598-019-54494-3

53. Alizadeh M, Shojadoost B, Astill J, et al. Effects of in ovo inoculation of multi-strain lactobacilli on cytokine gene expression and antibody-mediated immune responses in chickens. Front Vet Sci 2020; 7: 105. doi: 10.3389/fvets.2020.00105

54. Kathayat D, Closs G Jr, Helmy YA, Lokesh D, Ranjit S, Rajashekara G. Peptides affecting the outer membrane lipid asymmetry system (MlaA-OmpC/F) reduce avian pathogenic *Escherichia coli* (APEC) colonization in chickens. Appl Environ Microbiol 2021; 87(17): e0056721. doi: 10.1128/AEM.00567-21

55. Kathayat D, Closs G Jr, Helmy YA, Deblais L, Srivastava V, Rajashekara G. In vitro and in vivo evaluation of *Lacticaseibacillus rhamnosus* GG *and Bifidobacterium lactis* Bb12 against avian pathogenic Escherichia coli and identification of

novel probiotic-derived bioactive peptides. Probiotics Antimicrob Proteins 2022; 14(6): 1012–28. doi: 10.1007/s12602-021-09840-1

56. EFSA Panel on Biological Hazards (BIOHAZ), Koutsoumanis K, Allende A, Alvarez-Ordóñez A, et al. Update and review of control options for *Campylobacter* in broilers at primary production. EFSA J 2020; 18(4): e06090. doi: 10.2903/j.efsa.2020.6090

57. Zhao G, Huang X, Zhao J, Liu N, Li Y, Wang L, et al. Risk prevention and control points through quantitative evaluation of *Campylobacte*r in a large broiler slaughterhouse. Front Vet Sci 2020; 7: 172. doi: 10.3389/fvets.2020.00172

58. Lázaro B, Cárcamo J, Audícana A, Perales I, Fernández-Astorga A. Viability and DNA maintenance in nonculturable spiral *Campylobacter jejuni* cells after long-term exposure to low temperatures. Appl Environ Microbiol 1999; 65(10): 4677–81. doi: 10.1128/AEM.65.10.4677-4681.1999

59. Deckert A, Valdivieso-Garcia A, Reid-Smith R , et al. Prevalence and antimicrobial resistance in *Campylobacter spp*. isolated from retail chicken in two health units in Ontario. J Food Prot 2010; 73(7): 1317–24. doi: 10.4315/0362-028x-73.7.1317

60. Bai Y, Ding X, Zhao Q, et al. Development of an organic acid compound disinfectant to control food-borne pathogens and its application in chicken slaughterhouses. Poult Sci 2022; 101(6): 101842. doi: 10.1016/j.psj.2022.101842

61. European Food Safety Authority and European Centre for Disease Prevention and Control (EFSA and ECDC). The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2017. EFSA J 2018; 16(12): e05500. doi: 10.2903/j.efsa.2018.5500

62. Sohaib M, Anjum FM, Arshad MS, Rahman UU. Postharvest intervention technologies for safety enhancement of meat and meat based products; a critical review. J Food Sci Technol 2016; 53(1): 19–30. doi: 10.1007/s13197-015-1985-y

63. Rahman MH, Hossain MM, Rahman SME, Hashem MA, Oh D-H. Effect of repeated freeze-thaw cycles on beef quality and safety. Korean J Food Sci Anim Resour 2014; 34(4): 482–95. doi: 10.5851/kosfa.2014.34.4.482

64. Atterbury RJ, Connerton PL, Dodd CER, Rees CED, Connerton IF. Application of host-specific bacteriophages to the surface of chicken skin leads to a reduction in recovery of *Campylobacter jejuni*. Appl Environ Microbiol 2003; 69(10): 6302–6. doi: 10.1128/aem.69.10.6302-6306.2003

65. Shrestha S, Wagle BR, Upadhyay A, Arsi K, Donoghue DJ, Donoghue AM. Carvacrol antimicrobial wash treatments reduce *Campylobacter jejuni* and aerobic bacteria on broiler chicken skin. Poult Sci 2019; 98(9): 4073–83. doi: 10.3382/ps/pez198

66. Olsen A, Bonardi S, Barco L, et al. A comparison of European surveillance programs for *Campylobacter* in broilers. Food Control 2024; 155(110059): 110059. doi: 10.1016/j.foodcont.2023.110059

67. Directive 2003/99/EC of the European parliament and of the council of 17 november 2003 on the monitoring of zoonoses and zoonotic agents, amending council decision 90/424/EEC and repealing council directive 92/117/EEC. Off J Eur Union 2003; L325: 31–7.

68. European Food Safety Authority (EFSA), European Centre for Disease Prevention and Control (ECDC). The European Union one health 2023 zoonoses report. EFSA Journal. 2024; 22(12): e09106. doi: 10.2903/j.efsa.2024.9106

69. Tack DM, Ray L, Griffin PM, et al. Preliminary incidence and trends of infections with pathogens transmitted commonly through food - Foodborne Diseases Active Surveillance Network, 10 U.s. sites, 2016-2019. MMWR Morb Mortal Wkly Rep 2020; 69(17): 509–14. doi: 10.15585/mmwr.mm6917a1

70. Allos BM. *Campylobacter jejuni* Infections: update on emerging issues and trends. Clin Infect Dis 2001; 32(8): 1201–6. doi: 10.1086/319760

71. Ahmed J, Arfat YA, Bher A, Mulla M, Jacob H, Auras R. Active chicken meat packaging based on polylactide films and bimetallic Ag-Cu nanoparticles and essential oil. J Food Sci 2018; 83(5): 1299–310. doi: 10.1111/1750-3841.14121

72. Cdc C. Foodborne diseases active surveillance network (FoodNet): FoodNet surveillance report for 2012. In: CDC. Atlanta, GA; 2014.

73. Sibanda N, McKenna A, Richmond A, et al. A review of the effect of management practices on *Campylobacter* prevalence in poultry farms. Front Microbiol 2018; 9: 2002. doi: 10.3389/fmicb.2018.02002

74. Eriksson D, Råhlén E, Bergenkvist E, Skarin M, Fernström L-L, Rydén J, et al. Survival of *Campylobacter jejuni* in frozen chicken meat and risks associated with handling contaminated chicken in the kitchen. Food Control 2023; 145(109471): 109471. doi: 10.1016/j.foodcont.2022.109471

75. Wagenaar JA, French NP, Havelaar AH. Preventing Campylobacter at the source: why is it so difficult? Clin Infect Dis 2013; 57(11): 1600–6. doi: 10.1093/cid/cit555

76. Kingsbury JM, Horn B, Armstrong B, et al. The impact of primary and secondary processing steps on Campylobacter concentrations on chicken carcasses and portions. Food Microbiol 2023; 110(104168): 104168. doi: 10.1016/j.fm.2022.104168

77. Bordier M, Uea-Anuwong T, Binot A, Hendrikx P, Goutard FL. Characteristics of One Health surveillance systems: a systematic literature review. Prev Vet Med 2020; 181(104560): 104560. doi: 10.1016/j.prevetmed.2018.10.005

78. Foddai A, Nauta M, Ellis-Iversen J. Risk-based control of *Campylobacter spp.* in broiler farms and slaughtered flocks to mitigate risk of human campylobacteriosis – A One Health approach. Microb Risk Anal 2022;21(100190):100190. doi: 10.1016/j.mran.2021.100190

79. Alban L, Häsler B, van Schaik G, Ruegg S. Risk-based surveillance for meat-borne parasites. Exp Parasitol 2020; 208(107808): 107808. doi: 10.1016/j.exppara.2019.107808

80. Schiaffino F, Platts-Mills J, Kosek MN. A One Health approach to prevention, treatment, and control of campylobacteriosis. Curr Opin Infect Dis 2019; 32(5): 453–60. doi: 10.1097/QCO.0000000000000570

81. Dai L, Sahin O, Grover M, Zhang Q. New and alternative strategies for the prevention, control, and treatment of antibiotic-resistant Campylobacter. Transl Res 2020; 223: 76–88. doi: 10.1016/j.trsl.2020.04.009

82. Schiaffino F, Colston JM, Paredes-Olortegui M, François R, Pisanic N, Burga R, et al. Antibiotic resistance of *Campylobacter species* in a pediatric cohort study. Antimicrob Agents Chemother 2019;63(2). doi: 10.1128/AAC.01911-18

83. El-sayed El-Naenaeey, Norhan Abd El-Aziz, Alaa Sewid, Hashem A, Hefny A. Antimicrobial resistance, virulence-associated genes, and flagellin typing of thermophilic *Campylobacter species* isolated from diarrheic hamans, raw milk, and broiler niches, Slov Vet Res 2021; 58; Suppl. 24: 155–64.

84. Poly F, Noll AJ, Riddle MS, Porter CK. Update on Campylobacter vaccine development. Hum Vaccin Immunother 2019; 15(6): 1389–400. doi: 10.1080/21645515.2018.1528410

85. Nothaft H, Perez-Muñoz ME, Gouveia GJ, Duar RM, Wanford JJ, Lango-Scholey L, et al. Coadministration of the Campylobacter jejuni N-glycan-based vaccine with probiotics improves vaccine performance in broiler chickens. Appl Environ Microbiol 2017; 83(23): e01523–17. doi: 10.1128/AEM.01523-17

86. Kittler S, Fischer S, Abdulmawjood A, Glünder G, Klein G. Effect of bacteriophage application on *Campylobacter jejuni* loads in commercial broiler flocks. Appl Environ Microbiol 2013; 79(23): 7525–33. doi: 10.1128/AEM.02703-13

# Vrste kampilobaktrov v klavnicah za perutnino: pregled

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**Izvleček:** Bakterija kampilobakter je nenehna skrb pri zagotavljanju varnosti hrane, saj je eden najpogostejših patogenov v njej. Glavni vir kampilobaktra v hrani je perutninsko meso, pri čemer je primarna proizvodnja tega mesa kritična točka, kjer je treba sprejeti ukrepe za zmanjšanje njegove prisotnosti v prehranjevalni verigi. Zato so perutninske klavnice prepoznane kot kraji, kjer je treba izvajati ukrepe za nadzor in zmanjšanje števila bakterij *Campylobacter spp*. Izvajalci živilske dejavnosti so dolžni zagotoviti večjo higieno na klavni liniji, in sicer s pregledom opreme za vsak korak klanja in izvajanjem rednih protokolov čiščenja. Nenehno spremljanje prisotnosti in številčnosti bakterij *Campylobacter spp.* na klavni liniji zagotavlja podatke o ustreznosti ukrepov za nadzor higiene v klavnici, pa tudi podatke, potrebne za oceno mikrobiološkega tveganja v perutninskem mesu. Spremljanje prisotnosti bakterij *Campylobacter spp*. v klavnicah za perutnino je osnovna dejavnost, ki je neizogibna za sprejetje ukrepov za zmanjšanje onesnaženja, izboljšanje mikrobiološke varnosti pri predelavi perutnine in s tem izboljšanje sistema varnosti hrane kot celote. Namen tega pregleda je poudariti pomembnost preučevanja razširjenosti bakterij *Campylobacter spp.* v perutninskih klavnicah, pa tudi izvajanja ukrepov za preprečevanje in nadzor tega patogena tako na kmetijah kot v klavnicah. Ti ukrepi so nujni za zmanjšanje prisotnosti in prenašanja kampilobaktra pri perutnini, s čimer se zmanjša tudi tveganje za bolezni, ki se prenašajo s hrano.

**Ključne besede:** vrste kampilobaktrov; perutnina; klavnice; bolezni, ki se prenašajo s hrano; varna hrana