

## WHAT S HAPPEN WHEN PIGS OR POULTRY ARE DELIVRED TO SLAUGHTER PRIOR TO THE END OF WITHDRAWAL PERIOD?

Madalina BELOUS<sup>1</sup>, Daniel CUCA<sup>1</sup>

e-mail: [madalina.belous@spiruharet.ro](mailto:madalina.belous@spiruharet.ro)

### Abstract

The withdrawal period after treatment with microbials is established to minimize the concentration of residues in meat of treated pigs or poultry.

Even Food Chain has very precise rules about sending or not animals to slaughter before withdrawal period thus human errors may occur. In a prior study two questionnaires was distributed to food business operator (FBO) and competent authority (CA) involving 28 countries in and outside Europe (Romania included), involving pig meat production. Then in the second part of the study, the questionnaires were distributed for poultry meat production. The models developed in the previous study were applied for poultry industry and Romanian study case.

**Key words:** Microbial residues, consumer safety, sustainable environment.

Surveys about consumer perceptions have shown that European consumers are increasingly concerned about the quality of their food. Three out of 10 Europeans mentioned chemical residues from pesticides (31%), antibiotics (30%) and pollutants like mercury and dioxins (29%) as risk to be “very worried” about - according to a European survey about consumer perception about food safety (TNS, 2010).

Antimicrobials (AM) are widely used to treat clinical livestock diseases or even ass animal growth promoters (Landers et al., 2012). The primary producers are very aware about using antimicrobials, thus some AM residues exceeding the maximum residue limits (MRLs) are occasionally detected in monitoring programmes (EU Commission, 2010). Tetracyclines and sulfonamides are the most commune antimicrobial classes among animal production throughout the world (World Organization, 2016). The presence of antibiotic residues in foods of animal origin, combined with a failure to comply with the instruction for their use, particularly dose and withdrawal period, combined with wrong livestock production practices, may conduct to serious problems for consumer health (Stella et al., 2020).

Antimicrobials in food animals and poultry are used for three main purposes: therapeutic, prophylactic and growth promotions.

Persistence of antimicrobial residues might cause direct toxicity, allergic reactions, disturbance of the normal microbiota or marrow disorders (Menkem et al., 2019). According to Stella et al.

(2020) the emergence of antibiotic resistant bacteria may be linked to antibiotic resistance.

It is believed that low residue concentrations of AMs in foods are not ascribed to any public health issues (Baynes et al., 2016). Hence, focus should be on maintaining a low prevalence of such incidents and on low concentrations. According to Arsène et al. (2022), the toxic consequences can be divided into two groups – direct and indirect.

In Europe, negative human health consequences related to AM residues after consumption of contaminated meat or products thereof are rarely reported. This may be because of the low concentration of the AM in the raw meat. The case reports found in the literature deal mainly with allergies due to the presence of residues of beta-lactam antibiotics in meat as shown by Baptista et al. (2010). The last reported case dates to 2001 and refers to a person who had eaten beef and subsequently developed anaphylactic shock.

Thermal processes like cooking, roasting or boiling lead to a change in the properties of proteins, fats, water content, and reduce the food safety risk related to the AM residues by decreasing their concentration, as well as modifying their chemical structure or solubility (Rana et al., 2019; Almashhadany, 2020).

Usually, a pig or poultry producer would know when a batch of pigs or treated chickens has reached slaughter weight and would be ready to be shipped to the abattoir. A correct withdrawal period is applicable for the study cases. Correct marking and registration of the treatments make

<sup>1</sup> Faculty of Veterinary Medicine, Spiru Haret University, Bucharest, Romania

sure that pigs or poultry are not delivered to slaughter prior to the withdrawal period. Thus, finishing pigs or poultry may be sent to slaughter by mistake before the end of the withdrawal period, as shown by Alban et al. (2014) and Baptista et al. (2012).

In this situation, the pig or poultry producer may contact the abattoir after the delivery of the animals or birds for slaughter to report the unintentional shipment of treated animals. If the animals or birds have not yet been slaughtered, they will be identified, kept aside, and handled by the authorities in accordance with the Regulation 2019/2090 (EU Commission, 2019).

If slaughtering has taken place, the question is how the carcass and offal of a treated pig should be handled. Regulation (EU) 2019/2090 does not

give guidance for that situation (EU Commission, 2019).

A condemnation policy simply based upon a pig producer's information about premature delivery of animals for slaughter could lead to excessive food waste perhaps without any real need to protect consumer safety. This would contradict the EU policy of reducing food waste as outlined by the European Parliament Resolution (European Parliament, 2017) to reduce food waste in the European Union by 30 and 50% in 2025 and 2030.

The question is how to handle the situation when a farmer reports the accidental delivery of one or more treated pigs or poultry to the abattoir prior to the end of the withdrawal period. Moreover, would it be possible to develop best practices based upon the surveillance objective?

Table 1

Questionnaires distribution

Poultry production		Pork Production	
CA answers	6	CA answers	4
FBO answers	6	FBO answers	7
Total answers	12	Total answers	10
Total 22 answers			

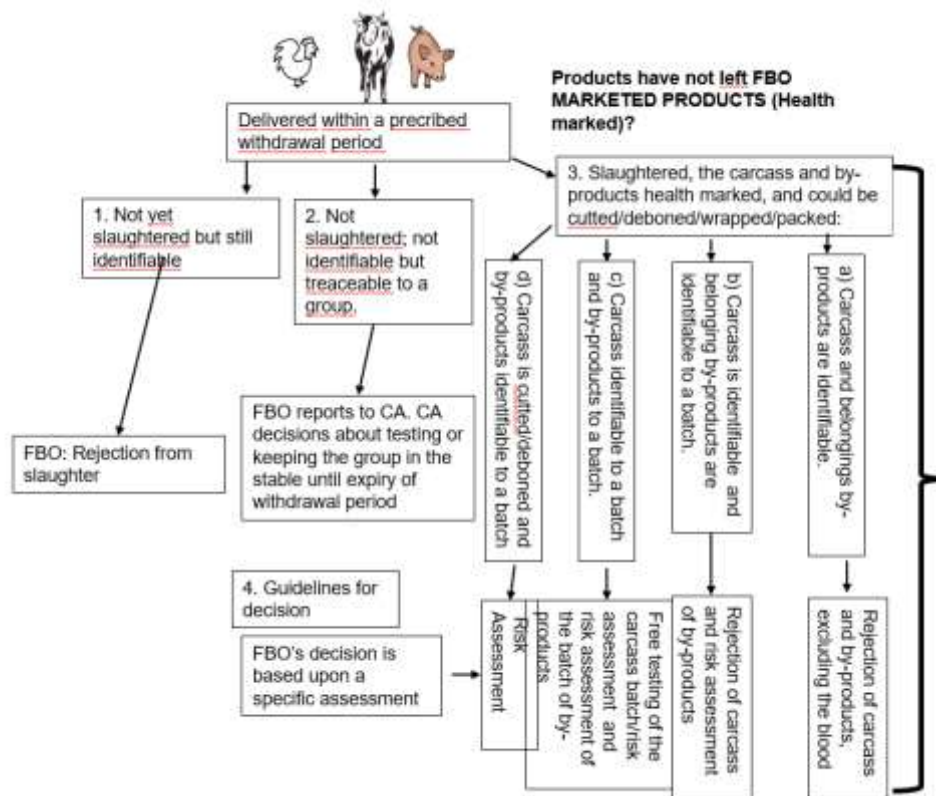


Figure1. FBO's decision about de-classification, recalling from market is based upon a risk assessment.

## MATERIAL AND METHOD

In the first part of the study, a questionnaire was developed by a project group with RIBMINS. The first parts dealt with routine detection and handling of AM residues in pigs delivered to an abattoir. That work is published separately (Alban et al., 2023). The original questionnaire dealt with the situation when a pig producer contacts the abattoir, because one or more pigs have been sent for slaughter by mistake before the end of the withdrawal period. For this study we analyzed the answers from Romania, and we distributed the 2 versions of the questionnaire for poultry industry, too. The two versions were designed for competent authority (CA) and food business operator (FBO).

It was explained to the respondents that the case dealt with a pig or poultry producer who had provided Food Chain Information (FCI) indicating compliance with the withdrawal periods.

A farmer later informed the abattoir that one or more pigs or birds had been sent before the end of the withdrawal period. The respondents were asked seven questions regarding ways of handling the situation, depending upon the time interval between the moment the animals were treated with AM and the moment the animals were slaughtered (Figure 1).

Two hypotheses were investigated. The first dealt with the potential difference in views between the CA and the FBO. The second dealt with the potential difference between facilities with a major part of their meat being traded or exported and others with minor exports of meat.

## RESULTS AND DISCUSSIONS

In this specific case of Romanian example, presented in this paper, a total of 22 answers was collected. Of these, 10 represented CA and 12 represented FBO. Likewise, 10 are represented by pig production and 12 by poultry production. Please see Table 1 for questionnaires distribution.

Based on the questionnaires we identify the following current practices when a farmer is calling abattoir about a batch of animals or poultry prior to withdrawal period: 1) the existence of procedures to handle such a situation and who should manage the case, 2) the situation where the individual animal has not yet been slaughtered and can be identified easily, 3) the animal has not yet been slaughtered, thus, it cannot be identified individually as it is part of a batch, 4) the animal has been slaughtered and the carcass cut, deboned and packed, traceability has been reduced to a lot, but the products have not left the abattoir, 5) the traceability has been reduced to a lot, and edible parts have left the abattoir and been placed on the market, 6) the animal by-products belonging to a lot, including blood, have already been placed on

the market, 7) meat or a meat product is placed on a market.

When a meat producer (pork or poultry) contacts the abattoir regarding delivery of pigs prior to the end of the withdrawal periods the delivered animals or birds can be alive or slaughtered and subjected to an official control including positive meat inspection decision and health marking in accordance with relevant legislation. If slaughtered and health marked, the carcass can be cut into three parts or more and deboned. The longer the time is between the delivery of the animals or birds and the farm producer contacting the abattoir, the more complicated the situation becomes.

There is some disagreement both within and between CA and FBO responders as to what the EU legislation allows regarding use of risk assessment and testing. Some CA treat the animals or birds in the same way as before the legislative change came into force in 2019 deleting the possibility of using testing.

When a producer reports that legal AMs have been used, testing is undertaken post slaughter and before the final meat inspection decision is done. This may be in cases where the withdrawal period has almost been complied with. This means that official veterinarians are focused on animal welfare and therefore following the regulations for killing without undue delay (EU Council, 2009).

## CONCLUSIONS

The future EU Directive about monitoring for residues of antimicrobial origin should focus on the objective of residue monitoring: to demonstrate compliance with legislation regarding MRL for legal antimicrobials and absence of use of prohibited antimicrobials. Moreover, standards for monitoring should be set to ensure a basic level of monitoring that can enable a comparison of results, acting as an incentive to reduce the prevalence of residues.

A best practices model which can be used both when the delivered and treated animals or birds are still alive and when it has been slaughtered, and the carcass is health marked. The best practice model involves a risk assessment, to be undertaken by the FBO and verified by the CA. The model consists of a risk-assessment approach that can be performed within one day, based on easily available data. This approach will likely lead to less food waste in line with the European Green Deal.

## ACKNOWLEDGMENTS

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