# Annex 1
# Research topics

## Research topics RT projects

| | TOPICS | Maximum duration (months) | Maximum grant |
|---|---|---|---|
| | **Animal health** | | |
| 1 | Antimicrobial resistance in aquatic animals (AquAMR) | 30 | € 275,000 |
| 2 | Opportunities for genetic selection for resistance to PRRS infection in pigs in Belgium (PigRReSist) | 48 | € 440,000 |
| 3 | Airborne transmission of highly pathogenic avian influenza viruses (Influe-Air) | 48 | € 440,000 |
| | **Plant health** | | |
| 4 | Risk-based detection surveys for EU quarantine pests in public green spaces (SURQUAPUB) | 36 | € 330,000 |
| | **Food safety** | | |
| 5 | Impurities in oil- or fat-derived food additives and compound foods (IMPOFAD) | 42 | € 400,000 |
| 6 | Purity and impurities of salt and salt substitutes (PUR(I)SALT) | 12 | € 110,000 |
| 7 | Plant toxins in foods derived from hemp (HEMPPLATOX) | 12 | € 110,000 |
| 8 | Microbiological risks associated with modifying the temperature-time pairs for the disinfection of knives and other cutting tools in slaughterhouses and meat processing plants (MICMEATOOL) | 12 | € 110,000 |

## Research topics RI projects: Euphresco - plant health

| | TOPICS | Maximum duration (months) | Maximum grant[i] |
|---|---|---|---|
| | **Plant health** | | |
| 2023-C-423 | Further development of methods for the outbreak management of *Popillia japonica* that are in line with the plant protection product authorisation in the EU | 12-24 | € 50,000 |
| 2023-F-431 | *Ralstonia pseudosolanacearum* and *Ralstonia syzygii*: emerging threats in and outside Europe. Study on the epidemiology and the development and validation of detection and identification protocols. | 12-24 | € 75,000 |
| 2023-E-447 | Valorization of HTS output data in view of a timely risk assessment of regulated or emerging plant viruses | 24-36 | € 150,000 |
| 2023-C-449 | Biological treatment schemes for plants and plant products infected with plant pests | 24-36 | € 100,000 |

[i] The FPS Health foresees **€ 300,000** to the transnational call. Since four topics are included, there might be insufficant budget for certain topics.

## 1. Antimicrobial resistance in aquatic animals (AquAMR)

### Context

In the context of antimicrobial resistance control, acquiring knowledge of antimicrobial use and resistance in (terrestrial and aquatic) animals is of considerable importance.

Both antimicrobial use and antimicrobial resistance of zoonotic, and commensal bacteria have been monitored in different animal species for several years. Registration of the use of antimicrobial products in food producing aquatic animals[ii] shall be put in place by 2027. In Belgium, aquaculture is a sector in which little to no information is available to date on the use of antimicrobial products and the origin and occurrence of antimicrobial resistance, data that are needed to develop a policy on antimicrobial resistance in food producing aquatic animals. In order to observe the effect on antimicrobial resistance with changes in the use of antimicrobial products in these animals, it is necessary to implement an optimal monitoring programme for this purpose. There is also little data available on this.

### Research questions

The research focuses on food-producing freshwater animals, referred to below as « *aquatic animals* ».

- Which zoonotic, commensal and pathogenic germs occur in aquatic animals in Belgium? How can they be detected?
- Which of the germs occurring in aquatic animals are of concern or could potentially be of concern to public health?
- Which of the germs occurring in aquatic animals are or could potentially be of interest in the context of antimicrobial resistance in general and for possible transmission of resistance to humans in particular?

The above research questions can be limited to a literature review if sufficient data is available.

- Is there a genetic link between the germs of aquatic animals exhibiting antimicrobial resistance on geographically different farms?
- What germ/antimicrobial product combinations are important for monitoring antimicrobial resistance in aquatic animals?
- What products (antimicrobials, biocides, etc.) are used in field conditions to treat aquatic animals or water in Belgium?
- What is the relationship between the use of products (antimicrobials, biocides, etc.) for the treatment of aquatic animals or water and the occurrence of resistance in aquatic animal germs under field conditions?
- What is the relationship between antimicrobial use in terrestrial animals and the occurrence of resistance in aquatic animal germs?

**Maximum budget: € 275,000**

**Maximum duration: 30 months**

[ii] For definition of aquatic animals see Regulation (EU) 2016/429 Animal Health Law, article 4 (3): 'aquatic animals' means animals of the following species, at all life stages, including eggs, sperm and gametes: (a) fish belonging to the superclass *Agnatha* and to the classes *Chonrichthyes*, *Sarcopterygii* and *Actinopterygii*; (b) aquatic molluscs belonging to the phylum *Mollusca*; (c) aquatic crustaceans belonging to the subphylum *Crustacea*.

## 2. Opportunities for genetic selection for resistance to PRRS infection in pigs in Belgium (PigRReSist)

### Context

The porcine respiratory and reproductive syndrome virus (PRRSV) is endemic in Belgium and large parts of the world. The virus causes great economic losses and also has an immunosuppressive effect, giving secondary infections a chance. The impact on antibiotic use may be significant. Existing vaccines provide only partial protection, and no new vaccines that induce optimal protection will be available in the near future. Given the high pig density in Belgium and aerogenic transmission of PRRSV, depopulation-repopulation is not a sustainable solution.

Relative to the American type of PRRSV, a genetic variation in resistance to the virus and the level of protection after vaccination could be demonstrated (Serão NV et al., 2016; Hess AS et al., 2016; Abella G et al., 2016; Niu P et al., 2016; Boddicker NJ et al., 2016). See also the publications of Reiner G, 2016; Dunkelberger JR et al., 2017; Lough G et al., 2018; Dong Q et al., 2021; Hickmann FMW et al., 2021; Sanglard LP et al., 2021; Rowland RRR et al., 2022; etc.).

Currently the research project RF 19/6335 PigRResponSe entitled "Unravelling the role of non-responding piglets and sows to vaccination against PRRSV is ongoing (until the end of September 2023). This will include analysis of the genetic background of non-responders to vaccination.

### Research questions

1) Is there genetic variation in resistance to the European strain of PRRSV and level of protection after vaccination within the main pig breeds/hybrids in Belgium? Here, the Piétrain breed should certainly be included.
2) Can field tests be developed and validated to enable selection for this genetic resistance?

**Maximum grant:** **€ 440,000**

**Maximum duration:** **48 months**

## 3. Airborne transmission of highly pathogenic avian influenza viruses (Influe-Air)

### Context

In recent years, an increasing number of outbreaks of Highly Pathogenic Avian Influenza (HPAI), mainly of the H5 serotype, have been identified in poultry worldwide. More than 40 million poultry were culled in the EU during the 2021-2022 season. The HPAI H5 virus also circulates in wild birds, with the host spectrum becoming increasingly broad. From wild bird populations, the virus is introduced into farms with poultry or other farmed birds. Especially in regions with a high poultry density, spreading between poultry farms is also observed.

Direct contact with infected birds is a major route of virus introduction into poultry and other farmed birds. The virus can also be introduced into poultry sheds by indirect means. There is evidence that the virus can also be introduced via the airborne route. For example, on a farm with laying hens in enriched cages, the first sick animals were noticed at an air intake far from the door. Torremorell M. et al. (2016)[iii] and Scoizec A. et al. (2018)[iv] were able to detect viral RNA and virus in air samples taken a short distance from infected poultry sheds. This has also been demonstrated in Belgium in the research project RF 18/6321 Emerdia-H5 II entitled "Development of experimental models to better understand the biology of recent highly pathogenic avian influenza (HPAI) H5Nx viruses and to improve their detection and control".

### Research objectives

- Determine the stability of HPAI H5 virus in air depending on temperature, humidity and particle size.
- Quantify the amount of infectious virus leaving the shed through ventilation as a function of the number of infected animals.
- Determine the size of the particles carrying the virus.
- Quantify the amount of infectious virus in the faeces of infected wild birds and the amount of virus that can be spread from the faeces of infected wild birds through the air, whether or not bound to particles.
- Develop a model to simulate the airborne spread of the HPAI virus from wild birds and poultry farms as a function of the number of infected animals, temperature, humidity, wind speed, distance and possibly other parameters. The model should be delivered to the competent authorities in a form that is usable in practice.

**Maximum grant:** **€ 440,000**

**Maximum duration:** **48 months**

[iii] https://doi.org/10.1637/11395-021816-Reg.1
[iv] https://doi.org/10.3389/fvets.2018.00015

## 4. Risk-based detection surveys for EU quarantine pests in public green spaces (SURQUAPUB)

### Context

To demonstrate the presence on Belgian territory of EU quarantine pests in forests, parks and public green spaces, the Federal Agency for the Safety of the Food Chain conducts annual detection surveys. These surveys may consist of visual inspections, supplemented or not by targeted sampling in case of suspicion, asymptomatic sampling, or the use of traps with attractants. The number of inspections, samples or traps for these surveys is determined in a pragmatic manner, taking into account the risk of introduction, the presence of host plants and high-risk activities, numbers achieved in other Member States, and the capacity and priorities of the inspection services.

Articles 22 to 24 of the Plant Health Regulation (EU) 2016/2031 stipulate that the conduct of these surveys must be based on risk analysis and sound scientific and technical principles. Moreover, for priority pests, these surveys must be conducted with sufficiently high reliability. This also applies to the EU quarantine pests listed in Annex II, Part B of Implementing Regulation (EU) 2019/2072, for which control and/or containment measures have been established. These surveys should be underpinned by pest survey cards, guidelines for statistically sound and risk-based surveys, and the statistical analysis tool RIBESS+ as provided by EFSA.
(https://efsa.onlinelibrary.wiley.com/doi/toc/10.1002/(ISSN)1831-4732.toolkit-plant-pest-surveillance)

The aim of this research project is to design statistically sound and risk-based detection surveys for EU quarantine pests that may occur in forests, parks and public green spaces. Specifically, we ask to map the host plant populations, identify the risk factors, work out scientifically correct detection methods and determine their sensitivity, and make sample calculations based on the legally imposed confidence and contamination levels. Where no confidence and contamination levels have been defined, simulations should be used to show what levels provide sufficient guarantees as to the presence of EU quarantine pests on the Belgian territory.

Botanical gardens and arboreta occupy a special place as sites of public green space because they are active in the (inter)national exchange of plants and plant propagation material. Therefore, an additional research network should be established in which Belgian botanical gardens and arboreta are involved in obtaining statistically relevant information on the presence of EU quarantine pests. By analogy with the existing Plant Sentinel Networks, the role of such a research network includes providing technical and scientific support to make observations at appropriate times and follow these up.

**Research objectives**

For the list of the following EU quarantine pests:

- *Agrilus anxius*;
- *Agrilus planipennis*;
- *Anoplophora chinensis*;
- *Anoplophora glabripennis*;
- *Aromia bungii*;
- *Bursaphelenchus xylophilus*;
- *Conotrachelus nenuphar*;
- *Ceratocystis platani*;
- *Dendrolimus sibiricus*;
- *Fusarium circinatum*;
- *Geosmithia morbida;*
- *Pityophthorus juglandis*;
- *Popillia japonica*.

*Xylella fastidiosa* is not included in this list because the research project RT 22/5 RIBSURX on this is ongoing.

1) Based on the EFSA pest survey cards, EPPO data sheets and pest risk analyses, and other recent scientific knowledge, determine the most appropriate survey methods, including visual inspections with sampling in case of suspicion, asymptomatic sampling, traps with attractants, any other method, or a combination thereof, and then develop detailed procedures for these.
2) Based on a Belgium-based analysis of potential routes of introduction, host plants present, businesses with risk activities and possible primary establishment locations, propose the most appropriate research sites.
3) Based, among other things, on EFSA's guidelines for statistically sound and risk-based surveys, make detailed sample calculations based on the legally imposed or, where not available, simulated, confidence and contamination levels deemed sufficiently high for Belgium.
4) The establishment of a research network consisting of Belgian botanical gardens, arboreta and research laboratories in which statistically relevant information is collected on the presence of the above-mentioned and the following EU quarantine pests: *Aleurocanthus spiniferus, Toxoptera citricida, Trioza erythreae* and *Xylella fastidiosa*. This network should have the necessary expertise and capacity to provide technical and scientific support to conduct observations and analyses at appropriate times. The development of a user-friendly and government-accessible reporting tool is indispensable in this.

The above list of EU quarantine pests may be modified or supplemented in the submitted project proposals depending on e.g. changes in legislation or the presence of host plants.

**Maximum grant: € 330,000**

**Maximum duration: 36 months**

## 5. Impurities in oil- or fat-derived food additives and compound foods (IMPOFAD)

### Context

Measurement data regarding impurities in oil- or fat-derived food additives are still insufficiently available.

Regulation (EC) 231/2012 establishes a set of specifications for food additives. However, the additive re-evaluation programme shows the need for additional purity requirements. Controls obviously focus on impurities for which specifications have been set, so the FASFC's measurement data do not include the other potential impurities.

Within the framework of Regulation (EC) 1881/2006, discussions on standards for glycidyl fatty acid esters in compound foods are taking place. EFSA has concluded that glycidol is a genotoxic and carcinogenic compound and the margin of exposure is so small that it poses a health concern. Therefore, standards are already in place for glycidyl fatty acid esters in oils and fats. However, a disproportionate contribution is possible through certain additives without standards for glycidyl fatty acid esters (for example, if 2% emulsifier is used in a fine bakery ware where the glycidyl fatty acid ester content in the emulsifier is 10 times higher than the content in the oil or fat), which makes it very difficult to arrive at derived standards, where the compound food standard is calculated from ingredient standards and data on the relative proportions of ingredients in the compound food.

There is also no consensus on whether there may be formation of glycidyl fatty acid esters in compound foods that also undergo heat processes. Direct measurements of these impurities in compound foods and experimental research on the potential formation can substantiate these discussions.

Compared to the successful reduction of glycidyl fatty acid esters in oil, to date this appears to be more laborious in additive manufacturing. The additive re-evaluation programme has set things in motion, but there is still much work ahead. Currently there are no standards in place for glycidyl fatty acid esters in additives; there are draft standards for some additives. Companies must respond to the call for data and ensure food safety. On the other hand, the current project will generate independent data that will allow us to see which additives need to be addressed in terms of tightening purity criteria. The project should in no way replace manufacturers' duty to generate and transmit data.

For oil and fat, many more standards have been set in the contaminants regulation than just for glycidyl fatty acid esters. Hardly anything is known about the occurrence of such contaminants in food additives related to fat. This project should also address contaminants such as persistent organic pollutants in additives, even though the EFSA has not requested data on these from manufacturers.

**Research objectives**

1) Determination of as many impurities as possible in a range of food additives containing fatty acids. Here, attention should be paid to the most frequently used additives, namely E570 fatty acids, E306 tocopherol-rich extract, E322 lecithin, E442 ammonium phosphatides, E470b magnesium salts of fatty acids, E471 mono- and diglycerides of fatty acids, E472a mono- and diglycerides of fatty acids, esterified with acetic acid, E472b mono- and diglycerides of fatty acids esterified with lactic acid, E472e mono- and diglycerides of fatty acids esterified with monoacetyl and diacetyl tartaric acid, E473 sucrose esters of fatty acids, E475 polyglycerol esters of fatty acids, E476 polyglycerol polyricinoleate, E481 sodium stearoyl-2-lactylate, and E492 sorbitan tristearate. It is desirable to take at least 5 samples per additive (more for lecithin).
   Due attention should also be paid to the relevant additives that may be used in foods for infants and young children: E304(i,) E306, E322, E471, E472a, E472b, E472c, E473. It is an advantage if also some additives are investigated that consist of fat-soluble colours extracted from plants.

   The following impurities are relevant:
   - Glycidyl fatty acid esters,
   - 3-MCPD fatty acid esters,
   - Polyaromatic hydrocarbons (PAHs): benzo(a)pyrene, benz(a)anthracene, benzo(b)fluoranthene, chrysene,
   - PFAS: PFOS, PFOA, PFNA, PFHxS, and possibly other PFAS,
   - PCBs (the congeners found in the contaminants regulation) and dioxins,
   - Mineral oil, specifically the fraction called MOAH (mineral oil aromatic hydrocarbons),
   - Lead,
   - *Possibly*: fat-soluble mycotoxins, such as zearalenone, fat-soluble pesticides, fat oxidation indicators, erucic acid, and possibly also the other fatty acids, trans fatty acids.

   Screening, semi-quantitative as well as quantitative methods can be proposed. However, the choice must be justified. In some cases, it might be useful to take a pooled sample to do a preliminary examination to estimate whether further examination is useful. This must also be justified.

   What is the potential contribution of the intake of these impurities through the considered additives to the total intake of these impurities through food?

2) Measurements of esters (glycidyl fatty acid esters and 3-MCPD fatty acid esters) in compound foods possibly under discussion for European contaminant standards (in consultation with FPS HFCSE).
   The research should be about foods where the content cannot be simply deduced from the presence of esters in oil/fat and the content of oil/fat in the compound food, i.e. for which Article 2 of Regulation 1881/2006 is difficult to apply or when there is formation of esters during the making of the compound food.

3) Research into the possible formation of glycidyl fatty acid esters (and 3-MCPD fatty acid esters) in the manufacture or preparation of certain compound foods

**Maximum grant: € 400,000**

**Maximum duration: 42 months**

## 6. Purity and impurities of salt and salt substitutes (PUR(I)SALT)

### Context

Given the daily consumption of sodium chloride, better known as salt, this food group is important for food safety. This also applies to salt substitutes, which add the salty taste but less or no sodium. Indeed, the health problem of excessive salt intake is related to sodium.
The project also includes iodised salt and nitrite curing salt and mixtures of salt and salt substitutes; an anti-caking agent may also have been added. Salt substitutes are mineral substances including potassium chloride, or solutions containing minerals. Herbs, spices and flavourings are not considered as salt or salt substitutes in the context of this project. The same goes for additives that are chemically salts but are not used for a salty taste. Optionally, the project includes salmiac salt (ammonium chloride as used in licorice candies).

The diversification of salts in the market has increased in recent years[v]. This variation raises questions about the purity levels of salts in the current market and the nature and safety of impurities. A recent scientific article points out the limitation of data on impurities in salt[vi].

In Belgium, the Royal Decree of 17 September 1968 on salt intended for human consumption applies. This Decree defines purity and sets maximum limits for some impurities for salt (sodium chloride) intended for human consumption, including for nitrite curing salt. This Decree still needs to be brought in line with the European harmonised standards for metals (lead, cadmium and mercury). If European harmonised standards are available, they automatically take precedence over national standards, even if the Royal Decree has not yet been amended. The national standards for arsenic and copper still apply.

The purpose of this project is to conduct a baseline study on the basis of which the FPS could assess whether and what changes to the legislation might be appropriate. Is lowering the (European) maximum limit for lead in salt feasible for better consumer protection? What additional impurities may be relevant to food safety: aluminium, ...?

The study should also collect data that can subsequently be used to assess the need to extend legislation to salt substitutes. Indeed, there is a gap in the legislation on salt substitutes. Potassium chloride is one example. Although specifications exist for potassium chloride as a food additive (E508, see Regulation 231/2012), these are not automatically applicable to the use of potassium chloride as a salt substitute. In addition, EFSA's (2019) reassessment of E508 includes a recommendation to lower standards for metals. Thus, there is a need for an overview and knowledge of purities and impurities of salt substitutes, as a basis for developing legislation.

The research should be framed within the domain of food safety. Researchers are asked to map as many different contaminants as possible and characterise purity.

[v] Types of salts on TV: https://www.vrt.be/vrtnu/a-z/over-eten/4/over-eten-s4a2/
[vi] Karavoltsos *et al*, Trace elements, polycyclic aromatic hydrocarbons, mineral composition, and FT-IR characterization of unrefined sea and rock salts: environmental interactions, Environmental Science and Pollution Research (2020) 27:10857–10868

**Research objectives**

- Mapping available data on purity and impurities in salt (sodium chloride), salt substitutes, iodized salt, nitrite curing salt, salmiac salt, and mapping legislations on the subject around the world. Mapping the risks of impurities according to the production methods. Mapping of products on the market.
- Through sampling and analysis of all types and brands (iodized or not) of salt and salt substitutes present as food on the Belgian market (for consumers and companies), mapping purity (concentration of sodium chloride or potassium chloride, according to the identity) and impurities (inorganic and organic impurities).

**Maximum grant:** **€ 110,000**

**Maximum duration:** **12 months**

## 7. Plant toxins in foods derived from hemp (HEMPPLATOX)

### Context

Hemp seeds and derivatives are marketed as food products. In 2015, the Scientific Panel on Contaminants in the Food Chain of the European Food Safety Authority (EFSA) issued a scientific opinion on human health risks associated with the presence of tetrahydrocannabinol (THC) in milk and other foods of animal origin. THC, specifically Δ9-THC, is the most relevant component of the hemp plant *Cannabis sativa*. EFSA established an acute reference dose (ARfD) of 1 µg Δ9-THC/kg body weight.

The European Commission Recommendation (EU) 2016/2115 of 1 December 2016 on the monitoring of the presence of Δ9-tetrahydrocannabinol, its precursors and other cannabinoids in food has not been implemented in Belgium to date.

In its Advice 25-2017, the Scientific Committee of the FASFC proposed action thresholds for THC in food of animal origin.

On 7 January 2020, EFSA published a scientific report assessing acute human exposure to Δ9-THC taking into account the data on its presence as generated in accordance with Recommendation (EU) 2016/2115. According to certain estimates of acute exposure, the ARfD of 1 µg/kg body weight was exceeded. Although exposure estimates are expected to overestimate acute exposure to Δ9-THC in the Union, current exposure to Δ9-THC poses a potential health risk.

Since the publication of Commission Regulation (EU) 2022/1393 of 11 August 2022 amending Regulation (EC) No 1881/2006 as regards maximum levels of delta-9-tetrahydrocannabinol (Δ9-THC) in hemp seeds and products derived therefrom, there are European standards for THC equivalents (Δ9-THC and Δ-9-THCA) in hemp seeds and hemp seed oil, applicable since 1 January 2023.

However, there are not yet specific standards for all derived consumer products. It is not clear whether consumers are already adequately protected by current standards. Since this is an acute reference dose, intake via a serving of a consumer product is relevant. This study could provide a basis for deciding whether standards development for compound foods with hemp seed ingredients is important.

There is also a demand for data for delta-8-THC so that we can make informed decisions on whether or not to include this substance in the standards for THC equivalents.

There is added value in including even more cannabinoids in the project, especially psychoactive substances and their precursors. A range of substances were listed in Recommendation 2016/2115. According to more recent literature, other substances have been found as well (Cinzia et al, Analysis of cannabinoids in commercial hemp seed oil and decarboxylation kinetics studies of cannabidiolic acid (CBDA), Journal of Pharmaceutical and Biomedical Analysis 149 (2018) 532-540).

Contacts with the EURL are desirable for the method of analysis. The method used should lead to reliable results.

The sampling method should provide analysis results that are representative of the sampled lot. Therefore, the sample must be large enough to accommodate heterogeneity within the lot: minimum 1 kg. The entire sample is homogenised during sample preparation.

Following the European Contaminants Regulation, there are plans for amendments to the Royal Decree of 31 August 2021 on the production of and trade in foodstuffs composed of or containing plants or plant preparations.

**Research objectives**

1) Determine delta-9-THC, delta-8-THC and THCA and other possible cannabinoids (see also Recommendation (EU) 2016/2115) in a representative number of (compound) foods based on hemp seeds or derivatives. This should be done using a validated analytical method with a limit of quantification (LOQ) not exceeding 0.1 mg/kg per substance, and low enough to establish an acute risk (an upperbound estimate of a negative sample should not result in an exceedance of the acute reference dose). A LOQ of 0.02 mg/kg is targeted for beverages. Minimum 60 samples.
2) Conduct a survey of consumers who use hemp oil or hemp seed or derivatives in cooking and consume hemp seed products as food to estimate the acute intake of THC equivalents from a serving of food containing hemp products.
3) Estimation of acute intake of THC equivalents based on portion sizes of the foods measured, for scenarios of different age groups, and comparison with EFSA's acute reference dose.

**Maximum grant:** **€ 110,000**

**Maximum duration:** **12 months**

## 8. Microbiological risks associated with modifying the temperature-time pairs for the disinfection of knives and other cutting tools in slaughterhouses and meat processing plants (MICMEATOOL)

### Context

Energy crises always result in significant external constraints on the various actors of the food chain. For the various sectors using hot water as a means of disinfecting their tools, this constraint may prompt operators to look into all possible alternatives to reduce their energy needs. For the slaughterhouse and meat cutting sector, one of these alternatives consists of modifying the water temperature/soaking time pairs of the tools when they are sterilised by soaking/spraying (usually briefly, i.e. 10-15 sec, at 82°C). However, the soaking time must be observed, taking into consideration the speed of the slaughter line. A recent French study demonstrated that other temperature-time pairs could show similar abatement efficiencies (expressed as the logarithmic reduction of concentrations of microbial organisms) as regards 'knife' type tools (instruction from the French Directorate for Food (DGAL) DGAL/SDSSA/2014-459; Minvielle et al., 2012, Disinfection of small equipment during activity). Nevertheless, this study and the corresponding scientific literature do not provide the necessary data for other types of tools, which often have cavities as well as more complex surfaces. In such cases, a *worst-case approach* is needed.

Regulation (EC) No 853/2004 laying down specific hygiene rules for food of animal origin stipulates that alternative methods of disinfecting tools to using water at at least 82°C, and recognised as equivalent to this technique, may be used during production by operators in slaughterhouses and cutting plants of animal meat, farmed game, poultry or lagomorphs, and in processing wild game.

### Research questions

- During experimental contaminations, what are the reductions (expressed in terms of logarithmic reduction of concentrations of microorganisms) that can be expected during soaking or spraying for a sufficiently wide range of contact time- temperature pairs, with these temperature-time pairs being also compatible with the normal activity of the slaughter line? This question must be answered for a range of tools that are representative of those that can be used on a slaughter line or in meat cutting plants. The microorganisms to be taken into account must at the least be those listed in the FASFC procedure PCCB/S3/1123560.
- What reductions can be expected when modifying temperature-time pairs by pre-rinsing tools? This question should ideally be answered via experimentation and can be supplemented by a literature review.
- In the context of energy savings, are there alternative methods: chemical, physical (ionization) or even biological methods?

**Maximum grant:** **€ 110,000**

**Maximum duration:** **12 months**

**2023-C-423 Further development of methods for the outbreak management of *Popillia japonica* that are in line with the plant protection product authorisation in the EU**

## Short description

The Japanese beetle (*Popillia japonica*) occurs in northern Italy in a large containment area. In recent years, many beetles have been found in pheromone traps near container terminals in other EU member states, so further outbreaks in the EU can be expected. The control of the Japanese beetle requires measures against the adult beetles as well as against the larvae in the soil. Current strategies to manage *P. japonica* are limited and efficient measures are often in conflict with the EU directive of sustainable use of pesticides. It is suggested that an Euphresco project should exchange and collect experiences of best practice and possibly further develop methods for the outbreak management of *Popillia japonica* that are in line with the plant protection product authorisation in the EU. Such methods could be based on attract and kill strategies and mass trapping with different lures against the adult beetles; as well as the use of entomopathogenic fungi and entomopathogenic nematodes against the larvae in the soil.

## Description of the end product

Recommendations for outbreak management of *Popillia japonica* in line with the plant protection product authorisation in the EU

## Provisional other funders

- Federal Ministry of Agriculture, Forestry, Regions and Water Management, Austria (contact: Ms Sylvia Bluemel, sylvia.bluemel@ages.at)
- Ministry of Agriculture, Forestry and Food, Slovenia (contact: Ms Erika Oresek, erika.oresek@gov.si)
- Ministry for Primary Industries, New Zealand (contact: Ms Aurélie Castinel, Aurelie.Castinel@mpi.govt.nz)
- National Plant Protection Organization, Netherlands Food and Consumer Products Safety Authority, Netherlands (contact: Mr Maikel Aveskamp, M.M.Aveskamp@nvwa.nl)
- Council for agronomic research and economic analysis, Italy (contact: Mr Sauro Simoni, sauro.simoni@crea.gov.it)
- Federal Ministry of Food and Agriculture, Germany (contact: Ms Silke Steinmöller, silke.steinmoeller@julius-kuehn.de)
- Department of Agriculture Food and the Marine, Ireland (contact: Ms Maria Laura Destefanis, Maria.Destefanis@agriculture.gov.ie)

## Provisional project duration

12-24 months

**2023-F-431 *Ralstonia pseudosolanacearum* and *Ralstonia syzygii*: emerging threats in and outside Europe. Study on the epidemiology and the development and validation of detection and identification protocols.**

### Short description

Recent findings of *Ralstonia pseudosolanacearum* in surface water in different places in Europe show that also the *Ralstonia* species that are considered 'tropical' can establish in Europe. In this light *R. pseudosolanacearum* and R. *syzygii* might become a threat to European agriculture. However, knowledge on the epidemiology, pathology, detection and identification of these species and their subspecies is still in development. In this project it is aimed to erect a platform in which know-how is exchanged and learn practices between plant bacteriologists working with *R. pseudosolanacearum* and *R. syzygii* in different fields (e.g. diagnostics, research, epidemiology). Such a platform enables the multinational collaboration in e.g. initiating research projects, collection sharing and development of harmonized detection and identification protocols.

### Description of the end product

Establishment of a network for sharing of knowledge in *Ralstonia* research

### Provisional other funders

- National Plant Protection Organization, Netherlands Food and Consumer Products Safety Authority, Netherlands (contact: Mr Maikel Aveskamp, M.M.Aveskamp@nvwa.nl)
- Federal Ministry of Agriculture, Forestry, Regions and Water Management, Austria (contact: Ms Sylvia Bluemel, sylvia.bluemel@ages.at)
- US Department of Agriculture, Animal and Plant Health Inspection Service, USA (contact: Ms Heike Meissner, heike.e.meissner@usda.gov)
- Bioreba AG, Switzerland (contact: Mr Marco Keiser, kaiser@bioreba.ch)
- Ministry of Agriculture, Forestry and Food, Slovenia (contact: Ms Erika Oresek, erika.oresek@gov.si)
- Benaki phytopathological institute, Greece (contact: Ms Irene Vloutoglou, i.vloutoglou@bpi.gr)
- Federal Ministry of Food and Agriculture, Germany (contact: Ms Silke Steinmöller, silke.steinmoeller@julius-kuehn.de)
- French Agency for Food, Environmental and Occupational Health & Safety, France (contact: Ms Géraldine Anthoine, geraldine.anthoine@anses.fr)
- Canadian Food Inspection Agency – Plant Research & Strategies, Canada (contact: Ms Brittany Day, brittany.day@canada.ca)
- Science and Advice for Scottish Agriculture, UK (contact: Mr David Kenyon, david.kenyon@sasa.gov.scot)

### Provisional project duration

12-24 months

**2023-E-447 Valorization of HTS output data in view of a timely risk assessment of regulated or emerging plant viruses**

## Short description

HTS is a powerful and fast evolving technology enabling simultaneous detection of plant pathogens without a priori knowledge on them. The number of HTS research output data in the phytosanitary field and especially in plant virology is accumulating fast. As a consequence, this induces bottlenecks in the ability to conclude on the biological significance and impact of novel viruses, complexes of viruses or viruses detected in new host plants. Time and resources are often lacking to initiate further genetic or biological characterization even though a framework therefore exists (Massart et al., 2017). HTS data sharing initiatives are currently running (e.g. the Euphresco 2020-G-346 data sharing initiative) and open the opportunity to (re-)use data, identify related findings and direct further research needs to underpin plant health policy. For legislators and risk managers it is important that these kind of emerging and shared concerns on specific pathogens are being identified in time, prioritized and further investigated to reach conclusions on the regulatory status or their potential threat.

This project proposal aims to bring together researchers to:

- map ongoing/finished HTS screenings on viruses and viroids and/or data sharing initiatives

- defining and standardising prioritization criteria to identify, within these datasets, organisms of concern that need further biological characterization to underpin plant health policy (e.g. emerging in several important crops or in several areas, regulated as EU quarantine organisms but with limited individual characterization data available, related to known harmful organisms, …).

- perform an in depth characterization (generating knowledge and data needed for risk assessment) of a limited number of prioritized viruses/viroids, herewith testing and optimizing a standardised framework that can be used for future datasets.

## Description of the end product

- Updated map on HTS-data on viruses and viroids
- Criteria for the prioritisation of identified organisms in HTS-datasets that need further characterisation and application on current relevant datasets

Characterisation of a number of prioritised viruses and viroids

## Provisional other funders

- Ministry of Agriculture, Forestry and Food, Slovenia (contact: Ms Erika Oresek, erika.oresek@gov.si)
- US Department of Agriculture, Animal and Plant Health Inspection Service, USA (contact: Ms Heike Meissner, heike.e.meissner@usda.gov)
- Ministry for Primary Industries, New Zealand (contact: Ms Aurélie Castinel, Aurelie.Castinel@mpi.govt.nz)
- National Plant Protection Organization, Netherlands Food and Consumer Products Safety Authority, Netherlands (contact: Mr Maikel Aveskamp, M.M.Aveskamp@nvwa.nl)
- Council for agronomic research and economic analysis, Italy (contact: Mr Sauro Simoni, sauro.simoni@crea.gov.it)

- Federal Ministry of Food and Agriculture, Germany (contact: Ms Silke Steinmöller, silke.steinmoeller@julius-kuehn.de)
- French Agency for Food, Environmental and Occupational Health & Safety, France (contact: Ms Géraldine Anthoine, geraldine.anthoine@anses.fr)
- Abiopep S.L., Spain (contact: Ms Yolanda Saiz, yh.saiz@abiopep.com)
- Science and Advice for Scottish Agriculture, UK (contact: Mr David Kenyon, david.kenyon@sasa.gov.scot)

**Provisional project duration**

24-36 months

**2023-C-449 Biological treatment schemes for plants and plant products infected with plant pests**

### Short description

The aim of the project is to study de feasibility and efficacy of biological treatments of plants and plant products infected by quarantine pests and diseases, including those defined as priorities at EU-level. Treatments to eliminate harmful organisms such as composting, ensiling, fermenting and digesting (e.g. in biogas production unit) can be envisaged. Scientific references deal already with this topic and an EPPO standard (PM 3/66) was recently published in this regard (https://onlinelibrary.wiley.com/doi/epdf/10.1111/epp.12879).
Starting from this standard, it would be very valuable to gather or generate pest-specific data for quarantine organism present or frequently intercepted in the EU on the treatment scheme (specific parameters) that must be met to achieve a complete elimination upon biological treatment (composting, digestion, …). A deliberate selection of (model) quarantine species or proxies can be considered to test in an experimental setup. This selection can be narrowed by choosing one or a few crops or plant products. Based on the biological characteristics of the harmful organisms and their hosts, extrapolation or modelling of parameters could be envisaged.

### Description of the end product

Treatment scheme for plants and plant products infected with harmful pests and diseases

### Provisional other funders

- US Department of Agriculture, Animal and Plant Health Inspection Service, USA (contact: Ms Heike Meissner, heike.e.meissner@usda.gov)
- All Russian Plant Quarantine Center, Russian Federation (contact: Mr Yuri Shneyder, yury.shneyder@mail.ru)
- National Plant Protection Organization, Netherlands Food and Consumer Products Safety Authority, Netherlands (contact: Mr Maikel Aveskamp, M.M.Aveskamp@nvwa.nl)
- Ministry of Rural Affairs, Estionia (contact: Ms Maarja Malm, Maarja.Malm@agri.ee)
- Ministry of Agriculture, Forestry and Food, Slovenia (contact: Ms Erika Oresek, erika.oresek@gov.si)

### Provisional project duration

24-36 months