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Delivering an Effective, Resilient and Sustainable EU-China Food Safety Partnership

Grant Agreement number:
727864 — EU-China-Safe

Acknowledgements

This report forms part of the deliverables of the project “EU-China-Safe” which has received funding from the European Union’s Horizon 2020 Research and Innovation programme under Grant Agreement No 727864 and from the Chinese Ministry of Science and Technology (MOST).

EU-China-Safe aims at reducing food fraud and improving food safety through focusing on improving food legislation, food inspection and increasing access to information across Europe and China. State-of-the-art technologies including a virtual laboratory will create a unique space to share and demonstrate best practice. The use of innovative technologies will result in improved detection of adulteration of food products as well as increased traceability and transparency of global supply chains.

The project runs from September 2017 to August 2021. It involves 33 partners and is coordinated by QUB (The Queen’s University of Belfast, UK).

More information on the project can be found at www.euchinasafe.eu

The content of this report does not reflect the official opinion of the European Commission and/or Chinese government. Responsibility for the information and views expressed therein lies entirely with the author(s).

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Nature of the deliverable		
ORDP	Open Research Data Pilot	
R	Document, report (excluding the periodic and final reports)	
DEM	Demonstrator, pilot, prototype, plan designs	
DEC	Websites, patents filing, press & media actions, videos, etc.	x
E	Ethics	
OTHER	Software, technical diagram, etc.	

Dissemination Level		
PU	Public, fully open, e.g. web	x
CO	Confidential, restricted under conditions set out in Model Grant Agreement	
CI	Classified, information as referred to in Commission Decision 2001/844/EC	



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1. SUMMARY

The aim of EU-China-Safe e-Newsletters was appropriate dissemination using various channels about project results to a wide range of stakeholders both within and outside the consortium, both in EU and China.

4 EU-China-Safe e-Newsletters were produced during the project lifetime to inform stakeholder's about project activities and its progress, events and trainings and other information related to the project actions.

These e-Newsletters were disseminated via various channels. Printed issues were distributed to delegates of various events such as China International Food Safety & Quality Conference (CIFSQ) and International symposium on Recent Advances in Food Analysis (RAFA). Electronic version was disseminated via e-mail at stakeholder's database and other partners' networks, via social media and also via the project website.

2. INTRODUCTION

The aim of EU-China-Safe e-Newsletters was appropriate dissemination about all project results to a wide range of stakeholders using various channels both within and outside the consortium, both in EU and China.

3. ACTIVITIES AND RESULTS

4 EU-China-Safe e-Newsletters were produced during the project lifetime (see **Annexes I – IV**) to inform stakeholder's about project activities and its progress, events and trainings and other information related to the project actions.

These e-Newsletters were disseminated via various channels. Printed issues were distributed to delegates of various events such as China International Food Safety & Quality Conference (CIFSQ) and International symposium on Recent Advances in Food Analysis (RAFA). Electronic version was disseminated via e-mail at stakeholder's database and other partners' networks, via social media and also via the project website at <http://www.euchinasafe.eu/newsletters.html> (see Figure 1).

4. CONCLUDING REMARKS

e-Newsletters summarised in brief EU-China-Safe actions, information about planned activities and its results, project events and other knowledge transfer activities relevant to the project actions. It served as a source of condensed details about the project for all who were interested in the project activities.

5. REFERENCES

Involvement of all project partners that contributed widely to the completion of this deliverable by providing content for individual e-Newsletters is acknowledged.

The screenshot shows the EUCINASAFE website with the following elements:

- Top navigation: "Sign up for stakeholders database", "euchinasafe.eu", "CN", "Partners area", and a search bar.
- Header: "EUCINASAFE 中欧食品安全" logo and the main title "Delivering an Effective, Resilient and Sustainable EU-China Food Safety Partnership".
- Secondary navigation: "HOME", "EU-CHINA-SAFE OVERVIEW", "WORKPLAN", "PARTNERS", "TRAINING", "VIRTUAL REFERENCE LAB", "DISSEMINATION", "EVENTS", "PRESS AND MEDIA".
- Hero image: "EU-China-Safe COLLABORATION" with a background of food preparation.
- E-NEWSLETTERS section:
 - EU-China-Safe 1st e-Newsletter, May 2019**: Includes a thumbnail image of various foods and a summary of the project's goals and participants.
 - EU-China-Safe 2nd e-Newsletter, February 2020**: Includes a thumbnail image of various foods and a summary of the project's progress and activities.
- Right sidebar: Social media icons for Twitter, LinkedIn, Facebook, YouTube, and Instagram.

Figure 1: Screenshot of the project website with the list of e-Newsletters

6. APPENDIX

- Annex I:** 1st EU-China-Safe e-Newsletter
- Annex II:** 2nd EU-China-Safe e-Newsletter
- Annex III:** 3rd EU-China-Safe e-Newsletter
- Annex IV:** 4th EU-China-Safe e-Newsletter



Annex I: 1st EU-China-Safe e-Newsletter



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 727864 and from the Chinese Ministry of Science and Technology (MOST).

www.euchinasafe.eu

In this issue:

EU-China-Safe in a nutshell

Project results

Data harmonisation and visualisation

Implementation of innovations in

- Food traceability
- Food authenticity
- Food safety

Confidence building and trade facilitation

Dissemination, exploitation and training

Dates for diary

Welcome to the 1st edition of the EU-China-Safe e-Newsletter.

EU-China-Safe is four years EU funded project that aims to mobilise resources in Europe and China to develop a cohesive partnership that will deliver a shared vision for food safety and authenticity and work towards “mutual recognition”.

Comprising 15 participants from the EU and 18 from China, EU-China-Safe contains key research organisations, government and industry needed to develop and jointly implement major advances in improving food safety and combating food fraud in the two trading blocks.

The aim of this newsletter is to provide you with a brief summary of the project and update you on some of the progress and project activities. We hope you find the newsletter useful.

Please contact us at euchinasafe@euchinasafe.eu with any suggestions for improvement.

EU-China-Safe IN A NUTSHELL:

Key facts:

Horizon 2020 Project
Type of action: RIA

Acronym:

EU-China-Safe

Website:

www.euchinasafe.eu

Duration:

48 months
September 2017 – August 2021

Co-ordinators:

prof. Christopher Elliott,
QUB, Belfast, UK &
prof. Yongning Wu, CFSA,
Beijing, China

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Strategic objective of EU-China-Safe is:

To develop and implement a shared vision of best practice within the EU and China that will enhance food safety, deter food fraud, restore consumer trust, deliver mutual recognition of data and standards and support the flow of agri-food trade between the two trading blocks to promote economic growth.

EU-China-Safe will build the core components needed for a joint EU-China food safety control system comprising: control management, food legislation, food inspection, food control laboratories, and food safety and quality information, education and communication.

The project will develop an EU-China Joint Laboratory Network that will achieve and demonstrate equivalency of results, and will develop a state of the art virtual laboratory, with interchangeable staff from two continents, that will be used as a “showcase” to communicate and demonstrate best practice. Innovative traceability tools will strengthen the most vulnerable supply chains. New or improved detection capabilities for chemical/microbiological hazards and food fraud will be implemented in a harmonised way across the EU-China network. Trade barriers caused by food safety and fraud issues will be analysed and recommendations of how to predict and prevent future events disseminated.

The project will focus on the most commonly reported foods linked to chemical and microbiological contamination and fraud (infant formula, processed meat, fruits, vegetables, wine, honey, spices). Substantial knowledge transfer and training actions will build high-level and long-term collaboration, synergies and trust between a wide range of EU and China actors.

These advances, in addition to a wider range of confidence building measures towards food safety, authenticity and transparency, will address consumer expectations and facilitate an expansion of EU- China trade.

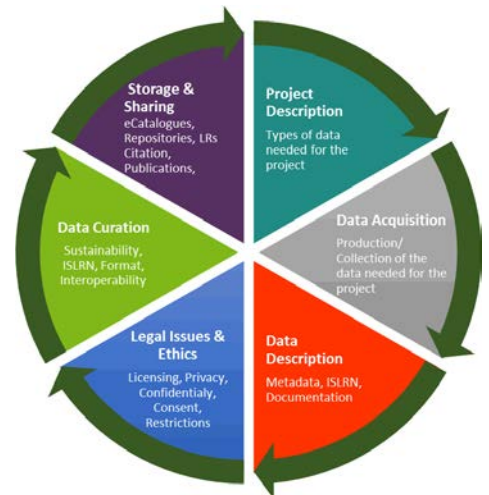
PROJECT RESULTS:

Data harmonisation and visualisation

EU-China-Safe aims at i) developing a Data Management Plan (DMP) aimed at overseeing and facilitating data extraction from various sources, and data generation in EU-China-Safe; ii) designing and maintaining an internal database suitable for storing the data generated in the project; iii) collecting, harmonizing when necessary, and collating data needed in research activities, and establishing common references for data from different sources and with different granularity, so that datasets can be linked together; iv) selecting and documenting data collection/storage methods and procedures, and where applicable also data analysis methods; and v) connecting EU-China-Safe to relevant data repositories where the generated data can be made available after the project end, in particular the H2020 Open Research Data Pilot.

Data Management Plan has been developed aimed at overseeing and facilitating data extraction from various sources, and data generation in EU-China-Safe.

The DMP catalogues the datasets used- or expected to be used over the course of the project. The DMP was updated as per the Open Research Data Initiative guidelines, and subsequent updates are planned for each reporting period.



Implementation of innovations in food traceability



EU-China-Safe aims at exploring various traceability techniques and technologies of several products moving between Europe and China. The main challenge related to food product traceability is that there is not necessarily a connection between the actual properties of a food product and the claims made in the traceability system. The final outcomes will be a digitised, DNA-based traceability system using blockchain to provide trustable data, a suite of traceability management and collaboration tools designed to support open and transparent sharing of information between supply chain members on both the EU and China sides aiming to prevent a major food safety crisis, and the development of alerting tools to identify inconsistencies in data recorded in traceability systems.

Digitised DNA technology system for traceability using pigs as a case study essentially complete. All pigs tracked from parent DNA through to delivery from EU into China.

Development of prototype alert system demonstrating pro-active traceability alerting tool already active. Work is beginning to assess an effective testing strategy based on already recorded data as well as the best methods to visualise and notify on the occurrence of alerts.

Information sharing portal/WiKi for evaluation of data quality for wine chains developed and published to assist with data coordination. Data sources in both EU and China identified and data collection has already begun via multiple means including comprehensive interviews with a variety of subject experts.

Implementation of innovations in food authenticity

EU-China-Safe aims at developing, transferring knowledge and implementing innovative research methods and processes for combating food fraud. Methodologies for detection of food fraud developed both in the EU and China will be transferred both ways, from the EU to China, and from China to the EU. The methodology will focus on five product groups that are all very susceptible to fraud, i.e. wine, dairy products (infant formula), processed meat, organic fruit and vegetables, and spices. Methodologies are based on the latest technologies and include state-of-the-art laboratory-based confirmatory methods. Handheld, portable machine vision based approaches for on-site screening will be trialled. In most cases the Standard Operating Procedures (SOPs) of the existing methodologies will be exchanged and the methods will be implemented in the laboratories of the other partners.

Good progress has been made with the **implementation of state-of-the-art laboratory-based confirmatory methods and novel, portable on-site screening methods.**

For **wine**, the method questionnaire, availability matrix, knowledge transfer activity and sampling have been completed successfully. Chinese partner will establish all assigned methods in time and might serve as multiplier and trainer to other Chinese laboratories. For **dairy products**, the LC-MS method development for protein contents is still ongoing and great progress has been made. SOPs and patents are being drafted for the different methods, while Chinese partner is working on proceeding with the GB standards for major whey and lactoferrin, respectively.



For **processed meats**, a confirmatory LC-MS methodology for the detection of water-retaining additives, and a spectroscopic screening method (using the SupNIR-1520 portable near-infrared spectrometer) for the adulteration of processed meat products have been developed and promising results have been obtained. For **spices**, the methodology for spice authentication (protocols for analysis of dyes in paprika powders generated by WU) has been exchanged with the Chinese partner (BJCDC). The method setup for the on-site/portable/handheld authentication of spices has been completed at WU (using the Specim IQ hyperspectral imaging camera) and QUB (using the SCiO molecular sensor). In-house and industry partner validation, and the analysis of results is still ongoing. For **fruits and vegetables**, methodology for detection of occurrence of pesticide metabolites developed to help in food regulators' efforts to crack down on illegal practices in organic farming.

Implementation of innovations in food safety

EU-China-Safe aims at i) addressing current challenges and gaps in microbiological and chemical food safety testing through the implementation of new or improved analytical methods; ii) transferring analytical methodology and harmonise testing between China and the EU; iii) improving the safety and quality of food consumed in Chinese and European markets; and iv) improving the food safety infrastructure in both China and the EU.



Good progress has been made on the **establishment of more efficient chemical methods and advances sequencing methods for certain pathogens**. One the major achievements to date was the **establishment of a method chlorate residues in Chinese laboratories** in April 2018. **A new LC-MS/MS method has been developed for the measurement of nitrofurans residues in meat**, which includes a number of new nitrofurans residues that are not including in current monitoring programmes. This new nitrofurans methodology uses a rapid microwave assisted derivatisation protocol and a rapid QuEChERS preparation protocol that will reduce turnaround times for domestic and imported food samples.

FERA has developed a **training programme for food contact materials**, which will be delivered from 2020. UCD have made significant progress on the **development of whole genome sequencing (WGS) protocols for pathogens** and have been working very closely with Chinese partners. **A rapid enzymatic inhibition method is being adapted for the rapid analysis of pesticides in horticulture crops** by AZTI. Contacts were made between VSCHT and Chinese Scientists on the **multi-class methods for the analysis of pesticides using LC-MS**.



Confidence building and trade facilitation

EU-China-Safe aims at building confidence in EU-China trade by improved understanding of consumer practices and regulatory frameworks, the latter by developing and demonstrating mutual recognition of laboratory standards and results. A virtual laboratory (RL2020) will be established to showcase new best practice, ensure harmonisation of laboratory procedures and to build confidence and mutual recognition of results. There will be a strong focus on exchanging best practices between the EU and China and will ensure that there is a full understanding of food safety and authenticity requirements to support compliance of exporting companies with both the EU and Chinese requirements, in support of enhancing bilateral trade of food/agri-food commodities. Emphasis will be placed on reaching consistent laboratory testing regimes as well as food safety standards underpinned by a robust risk assessment, with the aim of bolstering consumer confidence in both jurisdictions.



The virtual laboratory RL2020 will be the first time that practical laboratory analysis has been conducted in this shared and cooperative approach between two distinct global regions and laboratory networks. The cooperation and feasibility is already established and has potential to reduce costs and improve time in terms of laboratory response in future food safety incidents.

In addition to establishing the feasibility for technical aspects, groundwork has also been done to engage with key industry stakeholders and government organisations (EU and China) in relation to two commodities which face impediments in food trade between the EU and the China (stemming from different food safety standards). Methodology for the economic analysis of case studies has been established, and work has started to evaluate the incidents chosen using both a model that is widely used within Europe and one that is widely used within China has been proposed. This will be the first time such a comparison has been made and the results have the potential to create a major impact.

Dissemination, exploitation and training

EU-China-Safe aims at transferring knowledge, together with training, that is the key instrument for reinforcing cooperation and increasing the level of collaboration as well as enhancing synergy between the EU and China in food safety area. It will support the working synergies to be found between on-going EC projects and will maximise impact delivery in terms of improving safety of food supply and increasing consumer confidence in imported/exported agri-food products.

 **EU-China-Safe represented at a range of important scientific events:** [Belfast Summit on Global Food Integrity \(ASSET 2018, 29-31 May 2018, Belfast, UK\)](#), [International Forum on Food Safety and Health 2018 \(19-20 April 2018, Beijing, China\)](#), [12th China International Food Safety & Quality Conference \(CIFSQC, 7-8 November 2018, Shanghai, China\)](#), [8th International Symposium on Recent Advances in Food Analysis \(RAFA 2017, 7-10 November 2017, Prague, Czech Republic\)](#)



 **Series of peer reviewed scientific papers published**



Networking with other two EU H2020 projects established, MultiCoop (www.multicoop.eu) and Authent-Net (www.authent-net.eu)

Training program for consortium members, external scientists and stakeholders under preparation: Call for participation in the EU-China-Safe Training program planned in September 2019



Do you want to receive information about EU-China-Safe (activities, newsletters, organised events...)?

Please **Sign up for stakeholders database** [here](#).

Dates for diary:



EU-China-Safe will be represented at events:

[9th International Symposium on Recent Advances in Food Analysis \(RAFA 2019\)](#)

5-8 November 2019, Prague, Czech Republic

[China International Food Safety & Quality Conference \(CIFSQC\)](#)

30-31 October 2019, Beijing, China

We hope you have found this e-Newsletter interesting and informative. We would welcome your views on any of the issues covered. Please email at euchinasafe@euchinasafe.eu. Please feel free to distribute this EU-China-Safe e-Newsletter to other interested parties.

Disclaimer: The information expressed in this e-Newsletter reflects the authors' views; the European Commission is not liable for the information contained therein. The EU-China-Safe consortium cannot accept any liability for the e-Newsletter accuracy or content.

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Annex II: 2nd EU-China-Safe e-Newsletter



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 727864 and the Chinese Ministry of Science and Technology (MOST) for the National Key R&D Program of China under 2017YFE0110800.

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In this issue:

EU-China-Safe in a nutshell

EU-China-Safe progress

Implementation of innovations in:

- Food traceability
- Food authenticity
- Food safety

Confidence building and trade facilitation

Dissemination, exploitation and training

Coming soon

Dates for diary

Welcome to the 2nd edition of the EU-China-Safe e-Newsletter.

EU-China-Safe is four years EU funded project that aims to mobilise resources in Europe and China to develop a cohesive partnership that will deliver a shared vision for food safety and authenticity and work towards “mutual recognition”.

Comprising 15 participants from the EU and 18 from China, EU-China-Safe contains key research organisations, government and industry needed to develop and jointly implement major advances in improving food safety and combating food fraud in the two trading blocks.

The aim of this newsletter is to provide you with a brief summary of the project and update you on some of the progress and project activities. We hope you find the newsletter useful.

*Chris Elliott and Yongning Wu,
EU-China-Safe coordinators*



EU-China-Safe IN A NUTSHELL:

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Strategic objective of EU-China-Safe is:

To develop and implement a shared vision of best practice within the EU and China that will enhance food safety, deter food fraud, restore consumer trust, deliver mutual recognition of data and standards and support the flow of agri-food trade between the two trading blocks to promote economic growth.

EU-China-Safe will build the core components needed for a joint EU-China food safety control system comprising: control management, food legislation, food inspection, food control laboratories, and food safety and quality information, education and communication.

The project will develop an EU-China Joint Laboratory Network that will achieve and demonstrate equivalency of results, and will develop a state of the art virtual laboratory, with interchangeable staff from two continents, that will be used as a “showcase” to communicate and demonstrate best practice. Innovative traceability tools will strengthen the most vulnerable supply chains. New or improved detection capabilities for chemical/microbiological hazards and food fraud will be implemented in a harmonised way across the EU-China network. Trade barriers caused by food safety and fraud issues will be analysed and recommendations of how to predict and prevent future events disseminated.

The project will focus on the most commonly reported foods linked to chemical and microbiological contamination and fraud (infant formula, processed meat, fruits, vegetables, wine, honey, spices).

Substantial knowledge transfer and training actions will build high-level and long-term collaboration, synergies and trust between a wide range of EU and China actors.

These advances, in addition to a wider range of confidence building measures towards food safety, authenticity and transparency, will address consumer expectations and facilitate an expansion of EU-China trade.

Implementation of innovations in food traceability

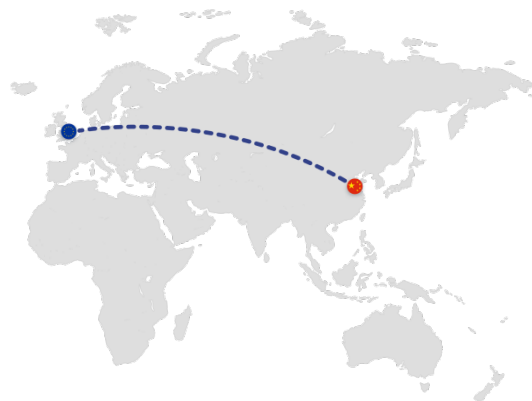


EU-China-Safe aims at exploring various traceability techniques and technologies of several products moving between Europe and China. The main challenge related to food product traceability is that there is not necessarily a connection between the actual properties of a food product and the claims made in the traceability system. The final outcomes will be a digitised, DNA-based traceability system using blockchain to provide trustable data. A suite of traceability management and collaboration tools designed to support open and transparent sharing of information between supply chain members in both the EU and China, aiming to prevent a major food safety crisis, and alerting tools to identify inconsistencies in data recorded in traceability systems will be developed.

Demonstration of a traceability example of pork moving from Cranswick farms to China, was completed with DNA analysis, and EU-China-Safe is looking at key areas to expand the solution to make it ready for commercial markets.

The work in Development of risk-based traceability management tools, as well as the expansion of the arc-net platform in Pro-active Traceability Alerting tools, bringing alerting and warning systems to the existing traceability solution, is nearing completion. This brings opportunities to predict supply chain issues before they occur and identify them in real time as they do. By adopting these complete solutions into the food production industry, we can offer secure, trustable, and transparent traceability leading to increased safety and confidence in the EU-China supply chain.

Mapping the local-global wine supply chain from Europe to China enabled identification and highlighted points of weakness. Various actors and stakeholders have been interviewed and both social and economic perspectives have been studied to reveal trends and figures of the wine market in China and Europe.



Implementation of innovations in food authenticity

EU-China-Safe aims at developing, transferring knowledge and implementing innovative research methods and processes for combating food fraud. Methodologies for detection of food fraud developed both in the EU and China will be transferred both ways, from the EU to China, and from China to the EU. The methodology will focus on five product groups which are all very susceptible to fraud, i.e. wine, dairy products (infant formula), processed meat, organic fruit and vegetables, and spices. Methodologies are based on the latest technology and include state-of-the-art laboratory-based confirmatory methods. Handheld, portable machine vision based methods for on-site screening will be trialled. In most cases the Standard Operating Procedures (SOPs) of the existing methodology will be exchanged and the methods implemented in the laboratories of the other partners.

The methodologies, developed both in the EU and China from previous research and established practices, for the detection of food fraud, are being transferred and implemented both ways, from the EU to China, and from China to the EU. Authentication methods involve wine, infant formula, processed meats, organic produce, and spices. The method exchange and validation with industry partners have also been performed for some of the product groups.

The analytical outcomes of the spot check performed on the integrity of European wines on the Chinese market showed agreement of results between partners and high levels of proficiency for the chosen methods.



Furthermore, the wine results also point to a variety of applied fraudulent practices among the tested samples, highlighting wine as a product at a high risk of fraud. Seven methods were established for the detection of adulterants in infant formula, together with the completion of the first draft of the Chinese GB standard for the *Determination of Lactalbumin in Infant Formula Foods and Milk Powder*. Methods for the detection of water retaining substances, carrageenan and glucomannan in meat, and for the screening of adulteration, show good potential for the fight against meat fraud. Portable light spectroscopy applications (SCiO and Specim IQ instruments) can be used as screening tools for pepper provided that the spectral database is expanded to develop more robust models which incorporate more (internal and external) product variation.

Implementation of innovations in food safety

EU-China-Safe aims at (i) addressing current challenges and gaps in microbiological and chemical food safety testing through the implementation of new or improved analytical methods; (ii) transferring analytical methodology and harmonise testing between China and the EU; (iii) improving the safety and quality of food consumed in Chinese and European markets; and (iv) improving the food safety infrastructure in both China and the EU.



Establishment of efficient analytical methodologies for food safety control is progressing well.

Multi-analyte UHPLC-HRMS method was developed and validated for screening of 425 analytes covering the classes of pesticides, mycotoxins and plant toxins in fruit, spices and teas. The method uses a rapid QuEChERS-like sample preparation, which allows the processing of large numbers of samples in a single day. Method transfer at Chinese laboratories is ongoing.

Another approach focused on development of a multianalyte enzyme inhibition screening method for pesticides residues showing high affinity towards 13 active substances.

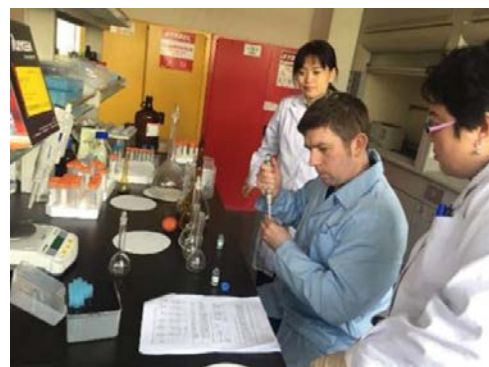
A new high throughput method was established for the determination chlorate and perchlorate residues in milk and milk powders using LC-MS/MS and transferred from the EU to laboratories in China. The results of validation showed that the method is simple, rapid and highly sensitive, and suitable for the determination of these residues in dairy samples. A Chinese National standard using this method is currently drafting.

The rapid LC-MS/MS methodology for the analysis of eight bound nitrofurans residues using a microwave-assisted derivatisation step and a modified QuEChERS-based sample extraction has been validated at EU partner laboratories, following the synthesis of new commercially available isotopically labelled standards.

Sample preparation and LC-MS/MS detection methods were also established for 13 antiviral drugs in meat.

Standardized operating protocols were developed for the whole genome sequencing (WGS) of three selected food-borne pathogens and transferred to Chinese collaborators.

Training content covering agreed topics on Food Contact Materials, which will be shared with the Chinese partners, has been also prepared.



Confidence building and trade facilitation

EU-China-Safe aims at building confidence in EU-China trade by improved understanding of consumer practices and regulatory frameworks, the latter by developing and demonstrating mutual recognition of laboratory standards and results. A virtual laboratory (RL2020) will be established to showcase new best practice, ensure harmonisation of laboratory procedures and to build confidence and mutual recognition of results. There will be a strong focus on exchanging best practices between the EU and China and will ensure that there is a full understanding of food safety and authenticity requirements to support compliance of exporting companies with both the EU and Chinese requirements, in support of enhancing bilateral trade of food/agri-food commodities. Emphasis will be placed on reaching consistent laboratory testing regimes as well as food safety standards underpinned by robust risk assessment, with the aim of bolstering consumer confidence in both jurisdictions.



Within the virtual lab, RL2020, details of methods and regulations that are used for food control have been exchanged. Two instrument vendors are collaborating in the EU and China. Validation studies for the analysis of dioxins in food using GC-MS/MS are underway, reference materials and proficiency test samples have been exchanged and analysed demonstrating good instrument performance.

Communication needs, expectations, perceived barriers and facilitators to building trust and confidence, and on consumer views have been analysed both within Europe and in China. An analysis of food trade impediments between the EU and China identified two commodities of interest (peanuts and infant formula milk). A questionnaire has been designed and some key stakeholders interviewed.

The work exploring nearly 3000 EU consumers' perceptions towards purchasing food products made in China (i.e. processed meat products or processed fruit and vegetable products) is going to be published.

Data collection has been completed for the Chinese consumer survey to explore perceptions towards purchasing one of two infant milk formulae (domestic or imported) using the theory of planned behaviour. Over 3000 Chinese consumers participated in the survey.

Dissemination, exploitation and training

EU-China-Safe aims at transferring knowledge, together with training, that is the key instrument for reinforcing cooperation and increasing the level of collaboration as well as enhancing synergy between the EU and China in the food safety area. It will support the working synergies to be found between on-going EC projects and will maximise impact delivery in terms of improving safety of food supply and increasing consumer confidence in imported/exported agri-food products.

EU-China-Safe Open Day and **Workshop on "Food Safety in China: Past, Present and Future"** were organised as satellite events of the 9th International Symposium on Recent Advances in Food Analysis ([RAFA 2019](#)), held from the 5th to 8th November 2019, in Prague, Czech Republic.



RAFA series is a leading event in recent advances in food analysis, attended in 2019 by 820 delegates from 53 countries. Therefore, RAFA 2019 offered a great floor for showcasing EU-China-Safe activities and networking with all interested scientists, industry representatives, media and other stakeholders.

The aim of the Open Day and Workshop at RAFA 2019 was to provide participants with a demonstration of some of the latest outputs from the project and to let participants know how to get involved with dissemination and training activities.

The audience was exposed to the information on developments and strategies in food traceability, food safety and authenticity control and demonstration of the best practice for a joint EU-China food safety control system, through the slide show, series of posters on progress in the project activities and scientific posters, scientific papers, leaflets and live demonstrations. Apart from scientific oral, poster and demo presentations, EU-China-Safe organised a draw for symposium participants who signed up as a stakeholder. Giorgia Purcaro from the University of Liege was the lucky winner of an EU-China-Safe umbrella.

Look at presentations given at the workshop on "Food Safety in China: Past, Present and Future" [HERE](#).

Look at series of posters demonstrating EU-China-Safe activities [HERE](#).

[Watch the video on EU-China-Safe at RAFA 2019 HERE!](#)



🍏 EU-China-Safe was represented at a range of scientific events, for example:

[DIOXIN 2019](#), 25-30 August 2019, Kyoto, Japan

[International Food Fraud Conference](#), 17-18 September 2019, Vejle, Denmark

[Aquaculture Europe 2019](#), 7-10 October 2019, Berlin, Germany

[International Akademie Fresenius Conference "Food Authenticity and Food Fraud Prevention"](#), 24-25 October 2019, Frankfurt, Germany

[9th International Symposium on Recent Advances in Food Analysis](#), 5-8 November 2019, Prague, Czech Republic



Series of new scientific papers published by EU-China-Safe consortium

[Look at the list HERE](#)



Networking with European Institute of Innovation & Technology (EIT) Food ([EIT Food](#)) established.

Massive Online Open Course:

🍏 [Farm to Fork: Sustainable food production in a changing environment](#)

About: How does food reach our plates? How is the food industry changing? What threats are there to food supply chains? How can we build a sustainable food industry? Queens University, Belfast in partnership with EIT Food, University of Turin, Analytics Engines and Italian Livestock Breeders Association (AIA) have designed an open online course to answer these questions and explore food and agriculture in the modern world. Over four weeks, learners will learn about the complexity of the global food chain, the vulnerability of the food industry to emerging threats and the solutions to stopping these threats early. Learners will also consider the issues surrounding production of food of animal origin.

COMING SOON:



TRAINING PROGRAM for consortium members, external scientists and stakeholders:





Call for participation in the EU-China-Safe Training program is planned at the beginning of March 2020. More information on applications can be found [HERE](#).

[Do you want to receive information about EU-China-Safe \(activities, newsletters, organised events...\)?](#)

Please **Sign up** for stakeholder's database [here](#).

The Distance Learning Programme will provide a number of study options including at Postgraduate Certificate (PgCert), Postgraduate Diploma (PgDip), and at Masters (MSc) level. In March 2020, 2 modules will commence, **Food Integrity, Fraud and Traceability** and **Global Food Standards and Legislation**. In September 2020 the **Advanced Analytical Tools for Food Safety** will run and in March 2021, the **Global Food Standards and Legislation** will run again. Further information can be found [here](#).

Online courses:

-  [Animal Feed Production: Feed Quality and Feed Safety](#)
Start date (The Animal Feed Quality): Monday 27th April 2020
Start date (The Animal Feed Safety Course): Monday 1st June 2020
-  [An Introduction to Food Systems](#)
Enrolment: Monday 2nd March 2020.
Note: This course is an invite only course but may be offered to professionals if demanded. Please contact qub.eitfoodeducation@qub.ac.uk for more information.
-  [An Introduction to Food Science](#)
Start Date: Monday 5th October 2020
-  [Digitalisation and technology in the food chain](#)
Start Date: Monday 2nd November 2020



EVENTS - Dates for diary:



EU-China-Safe will be represented at event:

[FoodIntegrity: Building transparency and trust](#)

18-19 March 2020, Twickenham Stadium, London, UK

EU-China-Safe will be showcased at the interactive workshop: [Developing risk communication using social science methods](#)

It is a scenario based interactive workshop which will explore ways of framing and delivering effective risk information to the public, nationally and internationally.

Other events:

[18th International Akademie Fresenius Conference](#)

["Food Safety and Dietary Risk Assessment"](#)

24-25 March 2020, Wiesbaden, Germany

[2nd Food Safety, Traceability and Compliance Forum 2020](#)

25-27 March 2020, Melbourne, Australia

[Analytica 2020](#)

31 March-3 April 2020, München, Germany

[13th European Pesticide Residue Workshop \(EPRW\)](#)

11-15 May 2020, Granada, Spain

[EuroResidue IX](#)

18-20 May 2020, Egmond, The Netherlands

[4th International Conference on Global Food Security](#)

Achieving local and global food security: at what costs?

15-18 June 2020, Montpellier, France

[HPLC 2020](#)

20-25 June 2020, San Diego, CA, USA

[North American Chemical Residue Workshop \(NACRW\)](#)

26-29 July 2020, Florida, USA

[40th International Symposium on Halogenated Persistent Organic Pollutants \(DIOXIN 2020\)](#)

30 August- 4 September 2020, Nantes, France

[134th AOAC Annual Meeting & Exposition](#)

11-17 September 2020, Orlando, FL, USA

[EU-China International Workshop on Food Authenticity and Traceability](#)

October 2020 Beijing, China

[34th EFFoST International Conference 2020](#)

Bridging high-tech, food-tech and health: Consumer-oriented innovations

November 2020, Israel

[Rapid Methods Europe 2020](#)

2-4 November 2020, Amsterdam, The Netherlands

[China International Food Safety & Quality Conference \(CIFSQC\)](#)

4-5 November 2020, Shanghai, China

We hope you have found this e-Newsletter interesting and informative. We would welcome your views on any of the issues covered. Please email at euchinasafe@euchinasafe.eu. Please feel free to distribute this EU-China-Safe e-Newsletter to other interested parties.

Disclaimer: The information expressed in this e-Newsletter reflects the authors' views; the European Commission is not liable for the information contained therein. The EU-China-Safe consortium cannot accept any liability for the e-Newsletter accuracy or content.

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Annex III: 3rd EU-China-Safe e-Newsletter



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 727864 and the Chinese Ministry of Science and Technology (MOST) for the National Key R&D Program of China under 2017YFE0110800.

www.euchinasafe.eu

In this issue:

EU-China-Safe in a nutshell

EU-China-Safe progress

Implementation of innovations in:

- Food traceability
- Food authenticity
- Food safety

Confidence building and trade facilitation

Dissemination, exploitation and training

Welcome to the 3rd edition of the EU-China-Safe e-Newsletter.

EU-China-Safe is four and half years EU funded project that aims to mobilise resources in Europe and China to develop a cohesive partnership that will deliver a shared vision for food safety and authenticity and work towards “mutual recognition”.

Comprising 15 participants from the EU and 18 from China, EU-China-Safe contains key research organisations, government and industry needed to develop and jointly implement major advances in improving food safety and combating food fraud in the two trading blocks.

The aim of this newsletter is to provide you with a brief summary of the project and update you on some of the progress and project activities. We hope you find the newsletter useful.

Chris Elliott and Yongning Wu,
EU-China-Safe coordinators



EU-China-Safe IN A NUTSHELL:

Key facts:

Horizon 2020 Project
Type of action: RIA

Acronym:

EU-China-Safe

Website:

www.euchinasafe.eu

Duration:

54 months
September 2017 - February 2022

Co-ordinators:

prof. Christopher Elliott,
QUB, Belfast, UK &
prof. Yongning Wu, CFSA,
Beijing, China

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Strategic objective of EU-China-Safe is:

To develop and implement a shared vision of best practice within the EU and China that will enhance food safety, deter food fraud, restore consumer trust, deliver mutual recognition of data and standards and support the flow of agri-food trade between the two trading blocks to promote economic growth.

EU-China-Safe will build the core components needed for a joint EU-China food safety control system comprising: control management, food legislation, food inspection, food control laboratories, and food safety and quality information, education and communication.

The project will develop an EU-China Joint Laboratory Network that will achieve and demonstrate equivalency of results, and will develop a state of the art virtual laboratory, with interchangeable staff from two continents, that will be used as a “showcase” to communicate and demonstrate best practice. Innovative traceability tools will strengthen the most vulnerable supply chains. New or improved detection capabilities for chemical/microbiological hazards and food fraud will be implemented in a harmonised way across the EU-China network. Trade barriers caused by food safety and fraud issues will be analysed and recommendations of how to predict and prevent future events disseminated.

The project will focus on the most commonly reported foods linked to chemical and microbiological contamination and fraud (infant formula, processed meat, fruits, vegetables, wine, honey, spices). Substantial knowledge transfer and training actions will build high-level and long-term collaboration, synergies and trust between a wide range of EU and China actors.

These advances, in addition to a wider range of confidence building measures towards food safety, authenticity and transparency, will address consumer expectations and facilitate an expansion of EU- China trade.

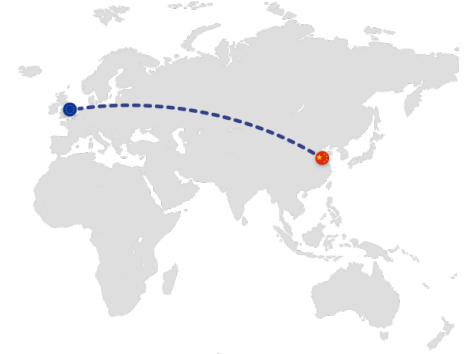
Implementation of innovations in food traceability



EU-China-Safe aims at exploring various traceability techniques and technologies of several products moving between Europe and China. The main challenge related to food product traceability is that there is not necessarily a connection between the actual properties of a food product and the claims made in the traceability system. The final outcomes will be a digitised, DNA-based traceability system using blockchain to provide trustable data. A suite of traceability management and collaboration tools designed to support open and transparent sharing of information between supply chain members in both the EU and China, aiming to prevent a major food safety crisis, and alerting tools to identify inconsistencies in data recorded in traceability systems will be developed.

Demonstration of a traceability example of pork moving from Cranswick farms to China was completed with DNA analysis.

The work in Development of risk-based traceability management tools, as well as the expansion of the arc-net platform in Pro-active Traceability Alerting tools, bringing alerting and warning systems to the existing traceability solution, was finalised. This brings opportunities to predict supply chain issues before they occur and identify them in real time as they do. By adopting these complete solutions into the food production industry, we can offer secure, trustable, and transparent traceability leading to increased safety and confidence in the EU-China supply chain.



Mapping the local-global wine supply chain from the Bordeaux region in France to China enabled identification and highlighted points of weakness. The mapping and analysis of the supply chain, and the indication of where fraud might happen was partly based on existing scientific literature, reports, and news stories, and partly on a number of interviews conducted with supply chain actors in France and in China.

Read the report on: [Mapping the local-global wine chain from Europe to China: Towards shared standards and benchmarks in wine traceability and authenticity](#)

Implementation of innovations in food authenticity

EU-China-Safe aims at developing, transferring knowledge and implementing innovative research methods and processes for combating food fraud. Methodologies for detection of food fraud developed both in the EU and China will be transferred both ways, from the EU to China, and from China to the EU. The methodology will focus on five product groups which are all very susceptible to fraud, i.e. wine, dairy products (infant formula), processed meat, organic fruit and vegetables, and spices. Methodologies are based on the latest technology and include state-of-the-art laboratory-based confirmatory methods. Handheld, portable machine vision based methods for on-site screening will be trialled. In most cases the Standard Operating Procedures (SOPs) of the existing methodology will be exchanged and the methods implemented in the laboratories of the other partners.

The methodologies, developed both in the EU and China from previous research and established practices, for the detection of food fraud, are being transferred and implemented both ways, from the EU to China, and from China to the EU. Authentication methods involve wine, infant formula, processed meats, organic produce, and spices. The method exchange and validation with industry partners have also been performed for some of the product groups.

The analytical outcomes of the spot check performed on the integrity of European wines on the Chinese market showed agreement of results between partners and high levels of proficiency for the chosen methods.



Furthermore, the wine results also point to a variety of applied fraudulent practices among the tested samples, highlighting wine as a product at a high risk of fraud. Seven methods were established for the detection of adulterants in infant formula, together with the completion of the first draft of the Chinese GB standard for the *Determination of Lactoalbumin in Infant Formula Foods and Milk Powder*. Methods for the detection of water retaining substances, carrageenan and glucomannan in meat, and for the screening of adulteration, show good potential for the fight against meat fraud. Portable light spectroscopy applications (SCiO and Specim IQ instruments) can be used as screening tools for pepper provided that the spectral database is expanded to develop more robust models which incorporate more (internal and external) product variation.

[Look at the Methods for food authenticity testing \(EU-China-Safe VIRTUAL REFERENCE LAB\)](#)

Read our latest papers:

Teresa M. Müller, Qiding Zhong, Shuangxi Fan, Daobing Wang, Carsten Fauhl-Hassek: [What's in a wine? – A spot check of the integrity of European wine sold in China based on anthocyanin composition, stable isotope and glycerol impurity analysis](#). *Food Additives & Contaminants: Part A* (2021) Vol 38 (8).

Sara W. Erasmus, Lisanne van Hasselt, Linda M. Ebbinge, Saskia M. van Ruth: [Real or fake yellow in the vibrant colour craze: Rapid detection of lead chromate in turmeric](#). *Food Control* (2021) Vol 121, 107714.

Schusterova D., Hajslova J., Kocourek V., Pulkrabova J.: [Pesticide residues and their metabolites in grapes and wines from conventional and organic farming system](#). *Foods* (2021) 10(2) 307.

Implementation of innovations in food safety

EU-China-Safe aims at (i) addressing current challenges and gaps in microbiological and chemical food safety testing through the implementation of new or improved analytical methods; (ii) transferring analytical methodology and harmonise testing between China and the EU; (iii) improving the safety and quality of food consumed in Chinese and European markets; and (iv) improving the food safety infrastructure in both China and the EU.



Multi-analyte UHPLC-HRMS method was developed and validated for screening of 425 analytes covering the classes of pesticides, mycotoxins and plant toxins in fruit, spices and teas. The method uses a rapid QuEChERS-like sample preparation, which allows the processing of large numbers of samples in a single day. Method has been transferred at Chinese laboratories and its applicability was verified through the interlaboratory study.

Another approach focused on development of a multianalyte enzyme inhibition screening method for pesticides residues showing high affinity towards 13 active substances.

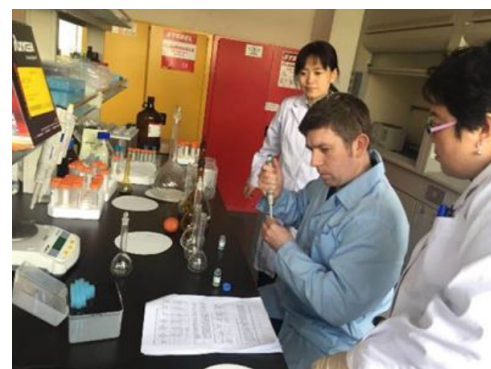
The rapid LC-MS/MS methodology for the analysis of eight bound nitrofurans residues using a microwave-assisted derivatisation step and a modified QuEChERS-based sample extraction has been validated at EU partner laboratories, following the synthesis of new commercially available isotopically labelled standards. [Watch the video about this method](#)

A new high throughput method was established for the determination chlorate and perchlorate residues in milk and milk powders using LC-MS/MS and transferred from the EU to laboratories in China. The results of validation showed that the method is simple, rapid and highly sensitive, and suitable for the determination of these residues in dairy samples.

Sample preparation and LC-MS/MS detection methods were also established for 13 antiviral drugs in meat. Work has commenced on the addition of antiviral drugs that could be potentially used against COVID-19 and African Swine flu. Standardized operating protocols were developed for the whole genome sequencing (WGS) of three selected food-borne pathogens and transferred to Chinese collaborators.

Training content covering agreed topics on Food Contact Materials, shared with the Chinese partners, has been also prepared.

Chinese partner (CAU) has developed a new ELISA method for the analysis of ribavirin in chicken muscle tissue.



A method for the analysis of nitrite and nitrate in milk powder was transferred from China (CFSA) and is being set-up in the EU (Teagasc) laboratories.

[Look at the Methods for food safety testing \(EU-China-Safe VIRTUAL REFERENCE LAB\)](#)

[Look at the methods on COVID-19 sampling and testing in food \(EU-China-Safe VIRTUAL REFERENCE LAB\)](#)

Confidence building and trade facilitation

EU-China-Safe aims at building confidence in EU-China trade by improved understanding of consumer practices and regulatory frameworks, the latter by developing and demonstrating mutual recognition of laboratory standards and results. A virtual laboratory (RL2020) will be established to showcase new best practice, ensure harmonisation of laboratory procedures and to build confidence and mutual recognition of results. There will be a strong focus on exchanging best practices between the EU and China and will ensure that there is a full understanding of food safety and authenticity requirements to support compliance of exporting companies with both the EU and Chinese requirements, in support of enhancing bilateral trade of food/agri-food commodities. Emphasis will be placed on reaching consistent laboratory testing regimes as well as food safety standards underpinned by robust risk assessment, with the aim of bolstering consumer confidence in both jurisdictions.



The [Virtual laboratory RL2020](#) will assist within the field of harmonising food control in terms of analytical response and knowledge, and sharing the information and methods.

[Watch the video about EU-China-Safe activities of virtual 'Reference laboratory 2020' \(RL2020\)](#)

[The dioxins method validation webinar](#) is available in the RL2020 database as a training resource.

The analysis of consumer attitudes and barriers to trade arising from food safety incidents will enable action to be taken to reassure the consumer and to identify actions that may remove barriers to trade.

Read the report: [Report on \(a\) the results of qualitative stakeholder interviews \(b\) the food trade impediments between the EU and the PRC that can be attributed to differences in food safety measures, \(c\) the results of EU quantitative consumer survey](#)

CFSA in China has completed two consumer surveys, to examine Chinese consumer perceptions, trust and purchase intentions towards food products made in China and EU. The first (N>7000) found the majority of respondents (>90%) believe that natural raw food is safer than food produced and processed by the modern food industry, and 70% considered home made food safest. The second (N>3000) explored the finding from a previous survey that consumers were more concerned about chemicals in food than microbial contamination. It identified that the public and professionals view risk differently, trust in stakeholders is an important factor in determining how the public perceive risks and how receptive they are to messages.

Communication needs, expectations, perceived barriers and facilitators to building trust and confidence, and on consumer views have been analysed both within Europe and in China. An analysis of food trade impediments between the EU and China identified two commodities of interest (peanuts and infant formula milk). Data on causes of rejections and recall incidents associated with commodities traded between EU and China were analysed. Chinese peanuts were identified as the main crop rejected at the EU border due to aflatoxin B₁, while it was found Chinese rejection of EU foods were mainly caused by incompliant quality of dairy products. There has been engagement with key industry and government stakeholders to identify trade impediments associated with divergent safety standards. This indicated improved traceability for EU baby milk might become more important for future sales of this product in China.

Dissemination, exploitation and training

EU-China-Safe aims at transferring knowledge, together with training, that is the key instrument for reinforcing cooperation and increasing the level of collaboration as well as enhancing synergy between the EU and China in the food safety area. It will support the working synergies to be found between on-going EC projects and will maximise impact delivery in terms of improving safety of food supply and increasing consumer confidence in imported/exported agri-food products.



Training program for consortium members, external scientists and stakeholders has been developed in collaboration with EU and China partners, including e-learning tools to support worldwide knowledge dissemination to the community not involved directly in the training program.

Due to on-going pandemic COVID-19 most of EU-China-Safe training activities are organised virtually.

Various short-term and long-term training and education activities at different levels are running within the EU-China-Safe project training program. The training program will facilitate exchange of expertise and knowledge transfer among the participants within and outside the project consortium, and support both staff and young scientists in development of their careers.

9 short-term training courses and 3 options for scientists mobility program have been proposed by trainers centres, based on commodity (A) and analytical methodology (B) and other (C) approaches, considering following threats: (i) microbiological, (ii) chemical and (iii) food fraud, and one of the food products (i) processed meat, (ii) wine, (iii) fruits/vegetables, (iv) spices, (v) dairy infant formula. Well established experts' institutes representing both academia, research and governmental organizations, and also having different expertise, acting as key trainers' centres and also contributing to the preparation of other training materials, include: QUB, Belfast, UK; UCT Prague, Czech Republic; BfR, Berlin, Germany; TEAGASC, Dublin, Ireland; UCD, Dublin, Ireland; Wageningen UR, Wageningen, The Netherlands; JRC, Geel, Belgium; FERA, York, UK.

e-learning tools/webinar(s) to support worldwide knowledge dissemination to the community not involved directly in the training program have been developed.



Massive Online Open Courses:



Prepared in Collaboration with European Institute of Innovation & Technology (EIT) Food ([EIT Food](#))

- [Introduction to Food Science](#)
- [Revolutionising the Food Chain with Technology](#)
- [Farm to Fork: Sustainable food production in a changing environment](#)
- [Understanding Food Supply Chains in a Time of Crisis](#)

Workshops focused on various aspects of food safety and authenticity, aimed at knowledge transfer to the community of professionals, associations, industry and other potential end-users are organised with the inputs from all trainers' centres, and are also aimed at presenting the achievements of the EU-China-Safe partnership.

So far, 4 workshops have been organised by QUB, BfR and Nofima, on "Innovation in wine authentication analysis" (BfR), "Fake news Under the Microscope" (QUB), "THREATS TO OUR FOOD SYSTEM: The impact of climate change and legislative changes on the control of mycotoxins and antimicrobial agents" (QUB), and "Why laboratory methods are not enough: detecting and combating food fraud by analysing records and traceability" (Nofima).

In addition to the planned training program, **series of twinning activities** in response to the tasks of individual EU-China-Safe workpackages have been organised to support knowledge transfer on developed methodologies between EU and China project partners.



China International Food Safety & Quality Conference

October 27 - 28, 2021
JW Marriott Hotel Beijing Central

EU-China-Safe acts as the **partner of the [China International Food Safety & Quality Conference \(CIFSQ 2021\)](#)**, organised in October 27 - 28, 2021, Beijing, China.

Two sessions on "**China Intergovernmental Cooperation on S&T Innovation / EU Horizon 2020 Food, Agriculture and Biotechnology Flagship Project**" are supported by EU-China-Safe experts.

EU-China-Safe was represented at these scientific events, for example:

- 🍏 [FOOD INTEGRITY & AUTHENTICITY: Global Cooperation and Response to Food Integrity and China's Leadership](#), China International Food Safety & Quality Conference, November 4-5, 2020, Shanghai
- 🍏 [5th Asia- Pacific Food Safety International Conference \(APFSIC 2021\)](#) on 27-28 January, Hong Kong, China.



[Watch the video on EU-China-Safe HERE!](#)



Virtual event highlighting current Trends & Views

RECENT ADVANCES IN FOOD ANALYSIS

3-4 November 2021
www.rafa2021.eu



Register FOR FREE now

EU-China-Safe scientists will be represented at **Virtual event highlighting current Trends & Views on RECENT ADVANCES IN FOOD (RAFA 2021)**, 3-4 November 2021, www.rafa2021.eu.

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Series of new scientific papers published by EU-China-Safe consortium:



[Look at the list of ALL SCIENTIFIC PAPERS HERE](#)

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Annex IV: 4th EU-China-Safe e-Newsletter



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 727864 and the Chinese Ministry of Science and Technology (MOST) for the National Key R&D Program of China under 2017YFE0110800.

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Chris Elliott and Yongning Wu, EU-China-Safe coordinators



Christopher Elliott

Professor of Food Safety
Founder, Institute for
Global Food Security
Queen's University Belfast



Wu Yongning

Chief Scientist, China National Center
for Food Safety Risk Assessment (CFSA)
Director, NHC Key Lab of Food Safety
Risk Assessment

EU-China-Safe IN A NUTSHELL:

Key facts:

Horizon 2020 Project

Acronym:

EU-China-Safe

Website:

www.euchinasafe.eu

Duration:

54 months

September 2017 - February 2022

Co-ordinators:

prof. Christopher Elliott, QUB,
Belfast, UK &
prof. Yongning Wu, CFSA,
Beijing, China

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Strategic objective of EU-China-Safe is:

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Substantial knowledge transfer and training actions will build high-level and long-term collaboration, synergies and trust between a wide range of EU and China actors. These advances, in addition to a wider range of confidence building measures towards food safety, authenticity and transparency, will address consumer expectations and facilitate an expansion of EU- China trade.

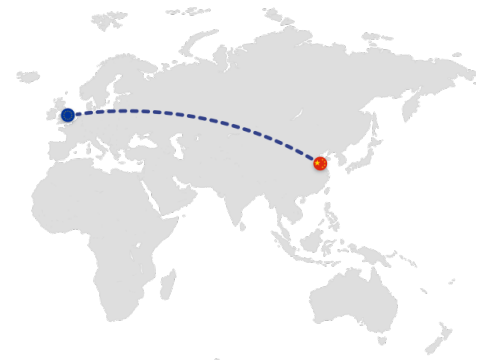
Implementation of innovations in food traceability



EU-China-Safe aims at exploring various traceability techniques and technologies of several products moving between Europe and China. The main challenge related to food product traceability is that there is not necessarily a connection between the actual properties of a food product and the claims made in the traceability system. The final outcomes will be a digitised, DNA-based traceability system using blockchain to provide trustable data. A suite of traceability management and collaboration tools designed to support open and transparent sharing of information between supply chain members in both the EU and China, aiming to prevent a major food safety crisis, and alerting tools to identify inconsistencies in data recorded in traceability systems will be developed.

Tasks focused on implementation of innovations in food traceability have demonstrated effective new techniques, learnings and software that can tackle the issues around traceability and verification within supply chains.

- (i) **Digital traceability solution making use of DNA analysis and blockchain technology** for end-to-end traceability of the pork products from the farm in the UK to final destination in China was developed and trialed.
- (ii) Development of **risk-based traceability management tools**, as well as the expansion of the arc-net platform in Pro-active Traceability Alerting tools, bringing alerting and warning systems to the existing traceability solution, was finalised. This brings opportunities to predict supply chain issues before they occur and identify them in real time as they do. By adopting these complete solutions into the food production industry, it can offer secure, trustable, and transparent traceability leading to increased safety and confidence in the EU-China supply chain.
- (iii) **Value chain mapping and analysis for EU-China wine chains**, evaluation of data quality, discrepancies and inconsistencies, and possible fraud / tampering / substitution in EU-China wine chains was completed.
- (iv) **Specification of an alert system to guide further checks and analysis in EU-China wine chains** and in general was finalised.



Mapping the local-global wine supply chain from the Bordeaux region in France to China enabled identification and highlighted points of weakness. The mapping and analysis of the supply chain, and the indication of where fraud might happen was partly based on existing scientific literature, reports, and news stories, and partly on a number of interviews conducted with supply chain actors in France and in China.

Read the reports on:

[Mapping the local-global wine chain from Europe to China: Towards shared standards and benchmarks in wine traceability and authenticity](#)

[Application, limitations, costs and benefits related to the use of blockchain technology in the seafood industry](#)

[All EU-CHINA-SAFE publications >>>](#)

Implementation of innovations in food authenticity

EU-China-Safe aims at developing, transferring knowledge and implementing innovative research methods and processes for combating food fraud. Methodologies for detection of food fraud developed both in the EU and China will be transferred both ways, from the EU to China, and from China to the EU. The methodology will focus on five product groups which are all very susceptible to fraud, i.e. wine, dairy products (infant formula), processed meat, organic fruit and vegetables, and spices. Methodologies are based on the latest technology and include state-of-the-art laboratory-based confirmatory methods. Handheld, portable machine vision based methods for on-site screening will be trialled. In most cases the Standard Operating Procedures (SOPs) of the existing methodology will be exchanged and the methods implemented in the laboratories of the other partners.

- (i) **The transfer and implementation of fraud detection methods for five product groups which are all very susceptible to fraud**, i.e. wine, dairy products (infant formula), processed meat, organic fruit and vegetables, and spices were completed.

The methodologies, developed both in the EU and China from previous research and established practices, for the detection of food fraud have been transferred and implemented both ways, from the EU to China, and from China to the EU. The method exchange and validation with industry partners have also been performed for some of the product groups.



The partners have completed the implementation of state-of-the-art laboratory-based confirmatory methods and novel, portable on-site screening methods. For **Wine**, the method questionnaire, availability matrix, isotope workshop and sampling have been completed successfully as well as the method establishment. CNRIFFI has established all assigned methods and will serve as multiplier and trainer to other Chinese laboratories. Method performance comparison between EU and China has also been completed. For **Dairy products**, the LC-MS method development for protein contents has finished. SOPs and patents have been drafted for the different methods, while ZJTH has worked on proceeding with the GB standards for major whey and lactoferrin, respectively. For **Processed meats**, confirmatory LC-MS methodology for the detection of water-retaining additives, and a spectroscopic screening method (using the SupNIR-1520 portable near-infrared spectrometer) for the adulteration of processed meat products have been developed and promising results have been obtained. Both methods have also been exchanged with the industry partner. For **Organic fruits and vegetables**, MS-based methodology has been transferred to the Chinese partner and method performance has been compared. For **Spices**, the methodology for spice authentication (protocols for analysis of dyes in paprika powders generated by WU) has been exchanged with the Chinese partner (BJCDC). The method setup for the on-site/portable/handheld authentication of spices has been completed at WU (using the Specim IQ hyperspectral imaging camera) and QUB (using the SCiO molecular sensor). Sample collection, exchange and analysis has also been completed. In-house and industry partner validation, and reporting has been completed as well.

[Look at the Methods for food authenticity testing \(EU-China-Safe VIRTUAL REFERENCE LAB\) and some of the EU-China-Safe papers:](#)

Teresa M. Müller, Qiding Zhong, Shuangxi Fan, Daobing Wang, Carsten Fauhl-Hasek: [What's in a wine? – A spot check of the integrity of European wine sold in China based on anthocyanin composition, stable isotope and glycerol impurity analysis](#). Food Additives & Contaminants: Part A (2021) Vol 38 (8).

Sara W. Erasmus, Lisanne van Hasselt, Linda M.Ebbinge, Saskia M. van Ruth: [Real or fake yellow in the vibrant colour craze: Rapid detection of lead chromate in turmeric](#). Food Control (2021) Vol 121, 107714.

Schusterova D., Hajslova J., Kocourek V., Pulkrabova J.: [Pesticide residues and their metabolites in grapes and wines from conventional and organic farming system](#). Foods (2021) 10(2) 307.

Claire McVey, Christopher T. Elliott, Andrew Cannavan, Simon D. Kelly, Awanwee Petchkongkaew, Simon A. Haughey: [Portable spectroscopy for high throughput food authenticity screening: Advancements in technology and integration into digital traceability systems](#). Trends in Food Science & Technology (2021) Volume 118, Part B, Pages 777-790.

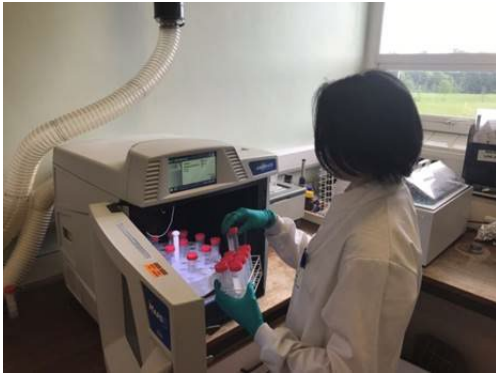
- (ii) Development, adaptation and implementation of the **assessment of fraud vulnerability in selected food chains** finalised. Partners have completed the examination of the vulnerability of the actors in the wine and spices' supply chains in the EU and China.

Food fraud vulnerability assessments provided interesting insights in the EU-China wine supply chain and the China-EU spice supply chain networks and understanding the contributions of various fraud factors to the overall fraud vulnerability. An amended version of the [SSAFE Food Fraud Vulnerability Assessment Tool](#) (FFVAT) was used for this purpose. The assessments showed that fraud vulnerabilities in the EU-China wine supply chain are medium to high level, with a high level of opportunities, medium level of motivational drivers and medium level of control measures implemented in the chain. The wine supply chain shows a high level of vulnerabilities, whereas the spice supply chain appears more resilient against fraud. Even though results showed that the opportunities and the motivations of the China-EU spice supply chain are lower than those in the EU-China wine chain, current control measures along the supply chain can still be improved, especially the external supplier controls.

[All EU-CHINA-SAFE publications >>>](#)

Implementation of innovations in food safety

EU-China-Safe aims at (i) addressing current challenges and gaps in microbiological and chemical food safety testing through the implementation of new or improved analytical methods; (ii) transferring analytical methodology and harmonise testing between China and the EU; (iii) improving the safety and quality of food consumed in Chinese and European markets; and (iv) improving the food safety infrastructure in both China and the EU.

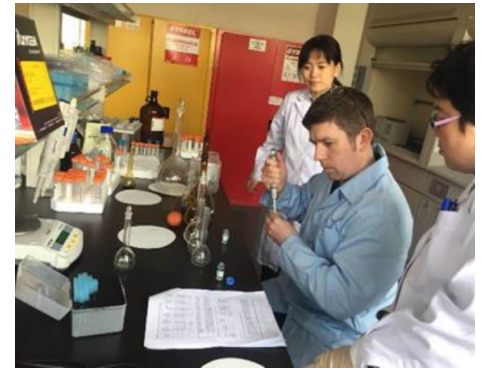


A range of analytical tools and protocols were developed and shared between the EU and China over the course of the project to improve the monitoring of chemical residues and biological pathogens in different food matrices.

A complex multiplex LC-HRMS/MS method was established in both EU and Chinese laboratories for the analysis of nearly 400 **contaminant residues in plant based materials**. The method uses a highly efficient software based approach that was developed to handle big data. It was also evaluated through inter-laboratory studies showing its excellent potential for the analysis of multiple contaminants in plant based materials.

In addition to HRMS methods a **multianalyte enzyme inhibition screening method** has been adapted for **selected phytosanitary products and food matrices** in order to provide the food industry with a useful tool that can be implemented in their control procedures.

The analysis of **antiviral drugs** and banned **nitrofurant antibiotics** ([Watch the video about this method](#)) was significantly enhanced through the development of three new methods. This timely because antiviral drug residues are to be added to EU monitoring programs from 2023. The possibility of emergent contaminant in meat has come to light due to the covid-19 crisis and Ugandan pork scandal. Fourteen drugs and metabolites (most of them antiretroviral drugs) were targeted, and a LC-MS/MS method was established for them in 2021.



The method for the analysis of **chlorates and perchlorates in milk and milk powders** was successfully transferred to Chinese laboratories. The results of validation showed that the method is simple, rapid and highly sensitive, and suitable for the determination of these residues in dairy samples.

Another method was established in EU laboratory for the analysis of **nitrates and nitrites in milk and dairy powders**, which can measure these contaminants to the Chinese limits.

Training content covering topics on **food contact materials** supporting knowledge development with respect to EU legislation and analytical methodologies was shared with the Chinese partners.

EU and Chinese researchers developed efficient whole genome sequencing approaches for the molecular characterisation of selected **foodborne pathogens** of importance to public health. This methodology is critical in terms of tracking and tracing the source of contamination in cases of foodborne illnesses.

[Look at the Methods for food safety testing](#) (EU-China-Safe VIRTUAL REFERENCE LAB)

[Look at the methods on COVID-19 sampling and testing in food](#) (EU-China-Safe VIRTUAL REFERENCE LAB)

Read some of the EU-China-Safe papers:

Clément Douillet, Mary Moloney, Melissa Di Rocco, Christopher Elliott, Martin Danaher: [Development and validation of a quantitative method for 15 antiviral drugs in poultry muscle using liquid chromatography coupled to tandem mass spectrometry](#). Journal of Chromatography A (2021) 462793.

Gemma Regan, Mary Moloney, Melissa Di Rocco, Padraig McLoughlin, Wesley Smyth, Steven Crooks, Christopher Elliott, Martin Danaher: [Development and validation of a rapid LC-MS/MS method for the confirmatory analysis of the bound residues of eight nitrofurant drugs in meat using microwave reaction](#). Analytical and Bioanalytical Chemistry (2021) Volume 414, pages 1375–1388.

[All EU-CHINA-SAFE publications >>>](#)

Confidence building and trade facilitation

EU-China-Safe aims at building confidence in EU-China trade by improved understanding of consumer practices and regulatory frameworks, the latter by developing and demonstrating mutual recognition of laboratory standards and results. A virtual laboratory (RL2020) will be established to showcase new best practice, ensure harmonisation of laboratory procedures and to build confidence and mutual recognition of results. There will be a strong focus on exchanging best practices between the EU and China and will ensure that there is a full understanding of food safety and authenticity

requirements to support compliance of exporting companies with both the EU and Chinese requirements, in support of enhancing bilateral trade of food/agri-food commodities. Emphasis will be placed on reaching consistent laboratory testing regimes as well as food safety standards underpinned by robust risk assessment, with the aim of bolstering consumer confidence in both jurisdictions.

(i) **Building of consumer confidence:** The analysis of consumer views within Europe and in China is aiding the understanding of choices and responses to food incidents. EU-China-Safe is unique in the data that it captures with respect to Chinese views on a range of factors, including perceptions of risk in the food chain, views on the safety of selected domestically produced and imported products, willingness to pay for enhanced food safety, acceptance of new technologies, sources of trust for information, and preferred channels to receive information. This task employed mixed methods research (stakeholder interviews, consumer focus groups and consumer surveys) to explore how best to build consumer confidence. Infant formula milk (IFM) and processed Chinese garlic were used as exemplar products to understand each export market (n=996 Chinese consumers and n=570 EU consumers, respectively). Chinese and EU consumer views on innovative food fraud strategies were further explored via online focus groups and informed the conclusions of the relevant study. Key recommendations to industry for the improved consumer communication of EU products to China were made

(ii) **Analysis of trade barriers:** The analysis of commodities related to food impediments between the EU and China (stemming from different food safety standards) will lead to the identification of mitigation measures to support the early identification and possible pro-active mitigation of such discrepancies.

Current cases of border rejections and disruptions in the flow of food products between the EU and China were reviewed and analysed.

Key industry and government stakeholders were consulted to enable the identification of priority areas where impediments to trade can be attributed to divergent food safety standards.

Global legislation and the scale of challenge in reaching the harmonisation of food safety standards was reviewed, with focus on legislation for aflatoxins in peanuts, to identify strategies promoting regulatory collaboration and thus trade, particularly between the EU and China.

A standard approach for early identification and mitigation of food trade impediments related to a discrepancy in food safety measures / standards was developed. A white paper on effective approaches for early identification and proactive mitigation of aflatoxins in peanuts as an important example for divergent food safety measures which can cause impediments to trade was produced.

(iii) **Development of an EU-China Laboratory Network: The virtual 'Reference Laboratory 2020' (RL2020)** linking EU and Chinese networks of laboratories, to showcase and demonstrate best practice and the state of the art in high quality food analysis, was established. This is the first attempt to develop such a concept over such a wide and complex network.



RL2020 is unique in having the capacity for staff and technicians to work on the same analytical processes and to produce results to the same quality standard. The exchange of methods and data for dioxins analysis has demonstrated the 'proof of concept' for the virtual laboratory. The work carried out to collate information on the partners capability for other methods, as well as quality control procedures will be used to develop and expand capability of the RL2020 where similar analytical instruments and data outputs allow, or where it can be converted to allow transfer between laboratories. This will allow data analysis for instrument outputs produced in one continent to be processed in another to demonstrate equivalency in process and quality standards. The overall aim of RL2020 is to allow a joint response to food control issues including incident response. This should have the potential to help solve food incidents quicker with less economic damage and will ultimately protect the consumer in terms of food safety.

- Knowledge transfer (two ways) of existing best practice between laboratories was tested. Questionnaires were developed and exchanged between key partners for environmental contaminants and for food contact materials. This was expanded to veterinary medicines and pesticides.
- Harmonisation of laboratory procedures aimed at building confidence and mutual recognition of results was supported. Details of methodology were exchanged for analytical methods initially in support of the development of RL2020, then for the transfer of methods between laboratories for scenarios on veterinary medicines and food contact materials.
- Development of consistent laboratory testing regimes and food safety standards was underpinned by robust risk assessment. European and Chinese regulations relevant to food control have been obtained and shared in the virtual laboratory.

- Similar instrumentation was obtained by European and Chinese partners with cooperation of instrument vendors in support of development of RL2020. A data sharing and storage platform has been established in support of the operation of RL2020. This was used in the validation of a method for dioxins.
- Past incidents as case studies were used to show how an integrated EU-China network could have improved the response to a crisis – laboratory analysis, communication and economic evaluation. A case study analysing economic cost and laboratory response in support of risk management actions was developed using the dioxins in Irish produce as an example. A second case study for melamine in Chinese infant formula, using a similar approach to that used for dioxins was also completed.
- Scenario planning for future food incidents was developed - response to a crisis - laboratory analysis, communication and estimating economic impact. Assessments of the utility of the virtual laboratory in dealing with a food safety incident and an economic analysis of how the virtual lab could impact trade by improving food safety through mutual recognition of data and standards and improve consumer trust were completed. This was supported by the use of two cases studies that were designed to reflect current issues. The first (biobased food contact materials) was chosen as a result of a large number of RASFF reports for these items following EU Commission action to enforce controls for bamboo items as they are not authorised. The second was chosen to be a more long standing situation linked to a method developed within EU-China-Safe where progress has been made to allow better monitoring and controls (nitrofurans in meat).



The [Virtual laboratory RL2020](#) will assist within the field of harmonising food control in terms of analytical response and knowledge, and sharing the information and methods.

[Watch the video about EU-China-Safe activities of virtual 'Reference laboratory 2020' \(RL2020\)](#)

[The dioxins method validation webinar](#) is available in the RL2020 database as a training resource.

The analysis of consumer attitudes and barriers to trade arising from food safety incidents will enable action to be taken to reassure the consumer and to identify actions that may remove barriers to trade.

Read the report: [Report on \(a\) the results of qualitative stakeholder interviews \(b\) the food trade impediments between the EU and the PRC that can be attributed to differences in food safety measures, \(c\) the results of EU quantitative consumer survey](#)

Read some of the EU-China-Safe papers:

Liran Christine Shan, Chenguang Li, Zhongyi Yu, Áine Regan, Ting Lu, Patrick Wall: [Consumer perceptions on the origin of infant formula: A survey with urban Chinese mothers](#). Journal of Dairy Research (2021) 88(2), 226-237.

Peng Miao, Si Chen, Jing Li, Xiaofei Xie: [Decreasing consumers' risk perception of food additives by knowledge enhancement in China](#). Food Quality and Preference (2020) Vol. 79:103781.

Julie L. Schiro, Liran Christine Shan, Mimi Tatlow-Golden, Chenguang Li, Patrick Wall: [#Healthy: smart digital food safety and nutrition communication strategies—a critical commentary](#). npj Sci Food (2020) 4, 14.

[All EU-CHINA-SAFE publications >>>](#)

Dissemination, exploitation and training

EU-China-Safe aims at transferring knowledge, together with training, that is the key instrument for reinforcing cooperation and increasing the level of collaboration as well as enhancing synergy between the EU and China in the food safety area. It will support the working synergies to be found between on-going EC projects and will maximise impact delivery in terms of improving safety of food supply and increasing consumer confidence in imported/exported agri-food products.

Training program:



TRAINING PROGRAM for consortium members, external scientists and stakeholders was developed in collaboration with EU and China partners, including e-learning tools to support worldwide knowledge dissemination to the community not involved directly in the training program.

The training program was developed to strengthen links and facilitate communication between EU and China partners within EU-China laboratory network. For the efficient knowledge transfer on developed technologies and other information generated within the project framework, comprehensive training program was developed, consisting of





establishing a training network, young scientist's mobility program, organisation a series of the workshops and other events to disseminate technological developments and build rapport between Chinese and European researchers, representatives of academia, food authorities, food industry and other stakeholders. In cooperation with the RL2020 specific information was provided to laboratories of EU-China laboratory network and other potential stakeholders.

Various short-term and long-term training and education activities at different levels were running within the EU-China-Safe project training program.

- (i) **Development of training and scientist mobility program** targeted at students, young scientists and staff employing various tools with the aim to help in their capacity building and assisting in the transfer of knowledge:

[Materials from these trainings](#)

- (ii) **Massive Online Open Courses** to support worldwide knowledge dissemination to the community not involved directly in the training program:

-  [Introduction to Food Science](#)
-  [Revolutionising the Food Chain with Technology](#)
-  [Farm to Fork: Sustainable food production in a changing environment](#)
-  [Understanding Food Supply Chains in a Time of Crisis](#)

- (iii) **Series of workshops focused on various aspects of food safety and authenticity**, aimed at knowledge transfer to the community of professionals, associations, industry and other potential end-users:

[Materials from these workshops](#)

- (iv) In addition to the planned training program, **series of twinning activities** in response to the tasks of individual EU-China-Safe activities have been organised to support knowledge transfer on developed methodologies between EU and China project partners.

Series of scientific papers published by EU-China-Safe consortium:



[Look at the list of ALL SCIENTIFIC PAPERS HERE](#)

OPEN ACCESS to data:

In order to make research data publicly available after the project lifetime, an EU-China-Safe community was created at Zenodo.org, a catch-all repository: <https://zenodo.org/communities/eu-china-safe/about/>.

Dissemination activities:

- (i) Watch our series of [knowledge transfer videos summarising selection of major project outputs!](#)

EU-China-Safe Knowledge Transfer video series

Episode 1: Wine Authentication Methods



- (ii) Latest events co-organised by the EU-China-Safe project:



China International Food Safety & Quality Conference (CIFSQ 2021), session on EU-China Safe: China Intergovernmental Cooperation on S&T Innovation / EU Horizon 2020 Food, Agriculture and Biotechnology Flagship Project (27-28 October, 2021, Beijing, China, hybrid event)

[Read report about this event, watch presentations](#)



Virtual event highlighting current
Trends & Views
**RECENT ADVANCES IN
FOOD ANALYSIS**
3-4 November 2021 www.rafa2021.eu

Virtual event highlighting current Trends & Views on
RECENT ADVANCES IN FOOD ANALYSIS ([RAFA 2021](#)) (3-4 November 2021, virtual event)

[Watch presentations at YOUKU](#)



Delivering an Effective, Resilient and Sustainable
EU-China Food Safety Partnership

**EU-China-Safe Final Meeting
and Stakeholder Engagement**
23 February 2022 | 09:00 - 13:15 (GMT) | Hosted via Zoom

EU-China-Safe Final Meeting and Stakeholder Engagement (23 February 2022, virtual event)

[Read the list of exemplars of the project outputs, watch the presentations](#)

At the end of the project, project coordinators QUB and CFSA in collaboration with EU and Chinese project consortium organised final meeting showcasing selected significant project outputs. The aim of this event was focus on the breadth and impact the project has delivered to date and will in the future.

All these activities enabled **excellent visibility of the EU-China-Safe** project. At all mentioned events / activities, various types of audience from many countries of Europe, China and worldwide were impacted, including scientific community, industry representatives, trade organisations, standards organisations, governmental bodies, policy makers, EU bodies, control bodies, academia / students, media and also general public.

Do you want to receive information about follow-up EU-China-Safe activities?

Please **Sign up** for EU-China-Safe stakeholder's database [here](#).

We hope you have found this e-Newsletter interesting and informative. We would welcome your views on any of the issues covered. Please email at euchinasafe@euchinasafe.eu. Please feel free to distribute this EU-China-Safe e-Newsletter to other interested parties.

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