CONTRACT FOR THE PROVISION OF:

Developing food chain templates for AMR risk assessment

Reference Number: FS307037

This document forms the contract for the Services between;

Food Standards Agency ("Client") having its main or registered office at Clive House, 70 Petty France, London SW1H 9EX

and

Ausvet Europe SAS ("Supplier"), 46 Boulevard de la Croix Rousse, Lyon

to be effective from 31/7/2020 until 31/01/2022 unless varied by extension.

CONTENTS

CONTRACT SCHEDULES

CONTRACT

WHEREAS

The Food Standards Agency has selected the Supplier to act as a Supplier in the performance of activities connected with the Project described on the title page of this contract, for The Food Standards Agency, the Supplier shall undertake to provide the same on the terms and conditions as set out in this Contract.

Unless and until directed otherwise, nothing in this Contract, shall be construed as giving a guarantee of any remunerative work whatsoever unless or until such work is requested and confirmed by means of a duly authorised Purchase Order.

IT IS AGREED AS FOLLOWS:

1. TERMS and CONDITIONS

1.1 As used in this Contract:

a) the terms and expressions set out in Schedule 1 shall have the meanings set out therein;

b) the masculine includes the feminine and the neuter;

c) the singular includes the plural and vice versa; and

d) the words “include”, “includes” and “including” are to be construed as if they were immediately followed by the words “without limitation”.

1.2. A reference to any statute, enactment, order, regulation or other similar instrument shall be construed as a reference to the statute, enactment, order, regulation or instrument as amended by any subsequent statute, enactment, order, regulation or instrument or as contained in any subsequent re-enactment thereof.

1.3. A reference to any document other than as specified in Clause 1.2 shall be construed as a reference to the document as at the date of execution of this Contract.

1.4. Headings are included in this Contract for ease of reference only and shall not affect the interpretation or construction of this Contract.

1.5. References to “Clauses” and “Schedules” are, unless otherwise provided, references to the Clauses of and Schedules to this Contract.

1.6. Terms or expressions contained in this Contract which are capitalised but which do not have an interpretation in Schedule 1 shall be interpreted in accordance with the common interpretation within the legal services market where appropriate. Otherwise they shall be interpreted in accordance with the dictionary meaning.

1.7. In the event and to the extent only of any conflict or inconsistency in the provisions of the Clauses of this Contract and the provisions of the Schedules, the following order of precedence shall prevail:

a) the duly authorised Client Purchase Order;

b) the Schedules; and

c) this Contract

2. THE SERVICES

2.1. This Contract shall govern the overall relationship of the Supplier and the Client with respect to the provision of the Ordered Services.

2.2. The Supplier shall provide the Ordered Services and meet its responsibilities and obligations hereunder in accordance with the provisions of Schedule 2 (Ordered Services) and Schedule 3 (Specific Obligations).

2.3. Notwithstanding clause 2.1, the Supplier shall perform the Ordered Services to the agreed satisfaction of the Client's Representative.

2.4. The Supplier shall notify the Client as soon as it becomes aware of an event occurring or which it believes is likely to occur which will cause material delay to or materially impede the performance of any Ordered Services or any part thereof and the Supplier shall take all necessary steps consistent with good practice to obviate and/or minimise the delay to the Client.

2.5. In the event that the Supplier fails due to its Default to fulfill an obligation by the date specified in any Purchase Order for such fulfillment, the Supplier shall, at the request of the Client and without prejudice to the Client's other rights and remedies, arrange all such additional resources as are necessary to either obviate the delay or to fulfill the said obligation as early as practicable thereafter, at no additional charge to the Client.

2.6. In the event that any obligation of the Supplier specified in the Contract is delayed as a result of a Default by the Client, then:

a) The date associated with the relevant obligation(s) as specified in the Purchase Order (and the dates similarly associated with any subsequent obligations specified in the Purchase Order) shall be amended by a period of time equal to the period of such Client Default (or such other period as the parties agree in writing); and

b) Both parties shall use all reasonable endeavors to obviate and/or mitigate the impact of such delay and to recover any resultant delay to the performance of the Ordered Services.

2.7. Nothing in this document, or any Purchase Order, shall have the effect of making the Supplier or any of the Supplier's other employees or agents, the employee of the Client.

2.8. Nothing in this document or any Purchase Order shall constitute the parties as partners of each other.

3. STANDARDS AND REGULATIONS

3.1. The Supplier shall at all times comply with the Health and Safety provisions, security requirements and personal conduct obligations, of any premises visited and shall exercise all due care and attention when visiting such premises.

3.2. The Supplier shall comply with all applicable national and local laws and regulations (including Data Protection Requirements) and obtain and maintain at its own cost throughout the duration of the Contract all the consents (including Data Protection Requirements), licences, permits and approvals which are necessary for the Supplier to perform its duties under this Contract and to enable the provision of the Ordered Services.

3.3. Without prejudice to the provisions of Clause 3.2, the Supplier shall ensure that he/she does not work in excess of the working time limits specified in the Working Time Regulations 1998. The Supplier shall maintain appropriate records regarding their working hours. Without prejudice to the obligations under this Clause 3.3, the Supplier shall make available to the Client any information of which it is aware concerning appointments held by an individual concurrently with the obligations of this Contract.

3.4. The Supplier shall be responsible for the administration and deduction of any income tax and national insurance in respect of payments made to such individuals, including in respect of any obligations under the Pay As You Earn system. The Supplier will, or procure that its Sub-Suppliers will, account to the appropriate authorities for any income tax, national insurance (if any), VAT and all other liabilities, charges and duties arising out of any payment made to the Supplier under any Purchase Order. The Supplier will indemnify and keep indemnified the Client against any income tax, national insurance (if any), VAT or any other tax liability including any interest, penalties or costs incurred in connection with the same which may at any time be levied, demanded or assessed on the Client by any statutory Agency in respect of payments made to the Supplier.

3.5. Nothing in this Contract shall be construed or have effect as constituting any relationship of employer and employee between the Client and the Supplier or its Sub-Suppliers. The Supplier shall indemnify and keep indemnified the Client, its officers, employees and agents against all actions, claims, demands, reasonable costs, charges and reasonable expenses incurred by or made against the Client, its officers, employees or agents arising out of or in connection with any services provided under any Purchase Order asserting that they are an employee of the Client or otherwise alleging any breach of any employment related legislation except where such claim arises as a result of any breach of obligations (whether contractual, statuary, at common law or otherwise).

4. MATERIAL BREACH

4.1. If the Supplier: -

does not, in the reasonable opinion of the Client Representative have the skills and experience required for the role of Supplier; or

fails to follow reasonable instructions given by the Client's Representative in the course of his or her work for the Client; or

presents, in the reasonable opinion of the Client's Representative, a risk to security; or

presents, in the reasonable opinion of the Client's Representative, a risk to the reputation of Her Majesty's Government; or

in the reasonable opinion of the Client's Representative is in some other ways unsuitable for to which he has been assigned pursuant to any Purchase Order;

then the Client may serve a notice on the Supplier requesting that the Supplier immediately cease activities under any Purchase Order.

4.2. Upon receipt of a notice under Clause 4.1 the Supplier shall immediately cease all activities in connection with the Client's instructions.

4.3. Notwithstanding the foregoing, the Client may, at any time, deny access to the Client's or its associates' premises without giving any reason for doing so.

4.4. Any activities performed prior to cessation under 4.1 shall be reimbursed on a *quantum meruit* basis.

5. NON-SOLICITATION

The parties agree that during the term of the appointment as described in any Purchase Order and for a period of twelve (12) months thereafter, they will not, whether directly or indirectly, solicit with a view to offering employment the other party and/or its employees or consultants. In the event that either party breaches this Clause, the defaulting party shall pay to the affected party all unavoidable and

reasonable costs incurred by the affected party including but not limited to a sum equal to the gross salary of the employee or the consultant due under any relevant notice. This Clause shall not restrict either party from appointing any person, whether employee or consultant of the other or not, who has applied in response to an advertisement properly and publicly placed in the normal course of business.

6. PARTIES RESPONSIBILITIES & OBLIGATIONS

The responsibilities for the Parties are set out in Schedule 2 and Schedule 3

7. CHARGES FOR ORDERED SERVICES

7.1. All engagements of the Supplier by the Client, of whatever nature, under the terms of the Agreement must be confirmed by means of a Purchase Order before commencement of the work.

7.2. All Charges on any Purchase Order placed under the terms and conditions of this Contract shall utilise the rates as per Schedule 4 as their basis.

7.3. In consideration of the performance of the Ordered Services in accordance with this Contract, the Client shall pay the Charges in accordance with the Invoicing Procedure.

7.4. Payment shall be made within thirty (30) days of receipt by the Client (at its nominated address for invoices) of a valid invoice (which shall be issued in arrears) from the Supplier.

7.5. The Charges are exclusive of Value Added Tax. The Client shall pay the Value Added Tax on the Charges at the rate and in the manner prescribed by law, from time to time.

7.6. "VAT on VAT" Prevention:

The Supplier shall not invoice, nor shall the Client be responsible for, any "VAT on VAT" payment. For the avoidance of doubt, in the event that:

a) the Supplier has incurred expenditure for goods or services from a third-party provider in respect of which the Supplier is entitled to reimbursement by the Client under the Contract; and

b) the third-party provider with whom the expenditure has been incurred has charged the Supplier UK VAT on the price of the relevant goods or services;

7.7. Interest shall be payable on any late payments under the Contract in accordance with the Late Payment of Commercial Debts (Interest) Act 1998.

7.8. The Supplier shall follow the Purchase Order and Invoice process as set out in Schedule 5. All invoices must reference the duly authorised Purchase Order number. Any invoices which do not reference the Purchase Order number shall be returned as unacceptable.

7.9. The Supplier shall continuously indemnify the Client against any liability, including any interest, penalties or reasonable costs incurred which is levied, demanded or assessed on the Client at any time in respect of the Supplier's failure to account for or to pay any Value Added Tax relating to payments made to the Supplier under this Contract. Any amounts due under this Clause 7.8 shall be paid in cleared funds by the Supplier to the relevant Agency not less than five (5) Working Days before the date upon which the tax or other liability is payable by the Client.

7.10. The Supplier shall accept the Government Procurement Card (GPC) as a means of payment for Ordered Services where GPC is agreed with the Client to be a suitable means of payment.

7.11. The Supplier shall accept payment electronically via the Banks Automated Clearing Service (BACS).

7.12. Euro

In the event that the United Kingdom joins the Economic and Monetary Union (and provided always that the exchange rate for conversion between Sterling and the Euro has been fixed), the Client shall at any time thereafter upon three (3) Months notice to the Supplier, be entitled to require the Supplier at no additional charge to convert the Charges from Sterling into Euros (in accordance with EC Regulation number 1103/97). The Supplier shall thereafter submit valid invoices denominated in Euros.

7.13. Efficiency

The Supplier shall be obliged at all times to seek to improve its efficiency in providing Services to the Client and to review the level of Charges in light of possible efficiency gains. Where such improved efficiency is achieved the Supplier shall propose a reduction in the level of Charges and effect such reduction by agreement with the Client.

8. AMENDMENTS and VARIATIONS TO THIS CONTRACT

No amendment to the provisions of this Contract or Special Terms specified in any Purchase Order shall be effective unless agreed in writing on a Variation form by both parties. Any increases in scope or value shall be the subject of separate negotiation but shall, in any event, be upon no less favourable terms than those contained herein.

9. COMMUNICATIONS

Except as otherwise expressly provided, no communication from one party to the other shall have any validity unless made in writing; nor shall any amendment to any Purchase Order be affected unless made by a duly authorised Purchase Order revision/Contract Variation.

10. TERM AND TERMINATION

10.1. This Contract shall take effect from the agreed start date and shall terminate when all requirements are satisfied.

10.2. The contract shall be subject to termination for convenience by either party subject to three months' notice.

10.3. The Client may at any time by notice in writing terminate any Purchase Order, or a part thereof, at 20 days' notice without charge. Terminations at less than 20 days' notice shall be subject to the Supplier's standard terms and conditions

11. CONSEQUENCES OF TERMINATION AND EXPIRY

11.1. In the event of termination in accordance with Clauses 10.2 or 10.3 the Client shall reimburse the Supplier any Charges incurred prior to termination which are wholly, reasonably and properly chargeable by the Supplier in connection with the Contract. The Client shall not be liable to pay any severance payment or compensation to the Supplier for loss of profits suffered as a result of the termination. Determination of such Charges shall be on a *quantum meruit* basis.

11.2. Termination, or partial termination, or expiry in accordance with Clause 10 shall not prejudice or affect any right of action or remedy that shall have accrued or shall thereafter accrue to either party.

11.3. In the event of termination of the Contract for any reason:

a) the Supplier shall return to the Client all Client Property and all Client Data and other items belonging to the Client in its possession;

b) subject to the payment of the appropriate portion for work completed, the Supplier shall provide the Client with a copy of all work undertaken to date (whether completed or not). and

c) Upon expiry or termination for any reason, the Supplier shall render reasonable assistance to the Client (and any third parties appointed by the Client) if requested, to the extent necessary to affect an orderly cessation of the Services.

12. WARRANTIES AND REPRESENTATIONS

12.1. The Supplier warrants and represents that:

a) it has full capacity and all necessary consents to enter into and to perform the duties as specified herein;

b) this Contract shall be performed in compliance with all applicable laws, enactments, orders, regulations and other similar instruments as amended from time to time;

c) the Supplier warrants that the Ordered Services shall be provided and carried out by appropriately experienced, qualified and trained personnel with all due skill, care and diligence;

d) it shall discharge its obligations hereunder with all due skill, care and diligence including good industry practice and (without limiting the generality of this Clause 12, in accordance with its own established internal procedures;

e) it owns, has obtained or shall obtain valid licenses for all Intellectual Property Rights that are necessary for the performance of this Contract and the use of the Ordered Services by the Client;

f) it has taken and shall continue to take all reasonable steps, in accordance with good industry practice, to prevent the introduction, creation or propagation of any disruptive element (including any virus, worm and/or trojan horse) onto the Ordered Service and into systems, data, software or Confidential Information (held in electronic form) owned by or under the control of, or used by, the Client;

g) it shall take all reasonable measures to avoid any and all data loss and data corruption during the provision of the Ordered Services in accordance with good industry practice;

13. LIMITATION OF LIABILITY

13.1. Neither the Client nor the Supplier excludes or limits liability to the other for death or personal injury arising from its negligence or any breach of any obligations implied by Section 12 of the Sale of Goods Act 1979 or Section 2 of the Supply of Goods and Services Act 1982 or for fraud or fraudulent misrepresentation.

13.2. Nothing in this Clause 13 shall be taken as limiting the liability of the Supplier in respect of Clause 14, Clause 15, and Clause 16.

13.3. In respect of any claims of liability arising out of the willful default of the Supplier, its employees, servants, the Supplier will have unlimited liability for all reasonably foreseeable loss suffered by the Client as a result of such act, omission or event giving rise to the claim.

13.4. Subject always to the provisions of Clauses 13.1, 13.2 and 13.3, the aggregate liability of the Client and the Supplier for each Year for all Defaults whether arising under contract, tort (including negligence) or otherwise in connection with this Contract shall in no event exceed whichever is the greater of Five hundred thousand pounds or a sum equivalent to one hundred and twenty five percent (125%) of the total charges paid or payable to the Supplier under all contracts entered into between the parties during a twelve (12) Month period specified by the claiming party, such twelve (12) Month period including the date on which at least one such Default arose.

13.5. Subject always to the provisions of Clauses 13.1, 13.2 and 13.3, in no event shall either the Client or the Supplier be liable to the other for:

a) indirect or consequential loss or damage; and/or

b) loss of profits, business, revenue, goodwill or anticipated savings.

13.6. Subject always to the provisions of Clauses 13.1, 13.2 and 13.3, and 13.4, , the provisions of Clause 13.5 shall not be taken as limiting the right of either the Client or the Supplier to claim from the other for:

a) reasonable additional operational and administrative costs and expenses;

b) any reasonable costs or expenses rendered nugatory; and

c) damage due to the loss of data, but only to the extent that such losses relate to the costs of working around any loss of data and the direct costs of recovering or reconstructing such data,

resulting directly from the Default of the other party.

13.7. The Client and the Supplier expressly agree that should any limitation or provision contained in this Clause 13 be held to be invalid under any applicable statute or rule of law it shall to that extent be deemed omitted, but if any either of them thereby becomes liable for loss or damage which would otherwise have been excluded such liability shall be subject to the other limitations and provisions set out herein.

14. DATA PROTECTION

14.1. The Supplier shall comply at all times with the Data Protection Requirements and shall not perform its obligations under this Contract in such a way as to cause the Client to breach any of its applicable obligations under the Data Protection Requirements.

14.2. The Supplier shall be liable for and shall indemnify (and keep indemnified) the Client against each and every action, proceeding, liability, reasonable cost, claim, loss, reasonable expense (including reasonable legal fees and disbursements on a solicitor and Agency basis) and demand incurred by the Client which arise directly or in connection with the Supplier's data processing activities under this Contract, including without limitation those arising out of any third party demand, claim or action, or any breach of contract, negligence, fraud, willful misconduct, breach of statutory duty or non-compliance with any part of the Data Protection Requirements by the Supplier or its employees, servants, agents or Sub-Suppliers.

14.3 The Parties acknowledge that for the purposes of the Data Protection Legislation, the Client is the Controller and the Supplier is the Processor unless otherwise specified in Schedule 12. The only processing that the Processor is authorised to do is listed in Schedule 12 by the Controller and may not be determined by the Processor.

14.4 The Processor shall notify the Client immediately if it considers that any of the Controller's instructions infringe the Data Protection Legislation.

14.5 The Processor shall provide all reasonable assistance to the Controller in the preparation of any Data Protection Impact Assessment prior to commencing any processing. Such assistance may, at the discretion of the Controller, include:

(a) a systematic description of the envisaged processing operations and the purpose of the processing;

(b) an assessment of the necessity and proportionality of the processing operations in relation to the Services;

(c) an assessment of the risks to the rights and freedoms of Data Subjects; and

(d) the measures envisaged to address the risks, including safeguards, security measures and mechanisms to ensure the protection of Personal Data.

14.6 The Processor shall, in relation to any Personal Data processed in connection with its obligations under this Agreement:

(a) process that Personal Data only in accordance with Schedule 12, unless the Processor is required to do otherwise by Law. If it is so required, the Processor shall promptly notify the Controller before processing the Personal Data unless prohibited by Law;

(b) ensure that it has in place Protective Measures, which are appropriate to protect against a Data Loss Event, which the Controller may reasonably reject (but failure to reject shall not amount to approval by the Controller of the adequacy of the Protective Measures), having taken account of the:

(i) nature of the data to be protected;

(ii) harm that might result from a Data Loss Event;

(iii) state of technological development; and

(iv) cost of implementing any measures;

(c) ensure that:

(i) the Processor Personnel do not process Personal Data except in accordance with this Agreement (and in particular Schedule 12;

(ii) it takes all reasonable steps to ensure the reliability and integrity of any Processor Personnel who have access to the Personal Data and ensure that they:

(A) are aware of and comply with the Processor's duties under this clause;

(B) are subject to appropriate confidentiality undertakings with the Processor or any Sub-processor;

(C) are informed of the confidential nature of the Personal Data and do not publish, disclose or divulge any of the Personal Data to any third Party unless directed in writing to do so by the Controller or as otherwise permitted by this Agreement; and

(D) have undergone adequate training in the use, care, protection and handling of Personal Data; and

(d) not transfer Personal Data outside of the EU unless the prior written consent of the Controller has been obtained and the following conditions are fulfilled:

(v) the Controller or the Processor has provided appropriate safeguards in relation to the transfer (whether in accordance with GDPR Article 46 or LED Article 37) as determined by the Controller;

(vi) the Data Subject has enforceable rights and effective legal remedies;

(vii) the Processor complies with its obligations under the Data Protection Legislation by providing an adequate level of protection to any Personal Data that is transferred (or, if it is not so bound, uses its best endeavours to assist the Controller in meeting its obligations); and

(viii) the Processor complies with any reasonable instructions notified to it in advance by the Controller with respect to the processing of the Personal Data;

(e) at the written direction of the Controller, delete or return Personal Data (and any copies of it) to the Controller on termination of the Agreement unless the Processor is required by Law to retain the

Personal Data.

14.7 Subject to clause 1.6, the Processor shall notify the Controller immediately if it:

(a) receives a Data Subject Access Request (or purported Data Subject Access Request);

(b) receives a request to rectify, block or erase any Personal Data;

(c) receives any other request, complaint or communication relating to either Party's obligations under the Data Protection Legislation;

(d) receives any communication from the Information Commissioner or any other regulatory authority in connection with Personal Data processed under this Agreement;

(e) receives a request from any third Party for disclosure of Personal Data where compliance with such request is required or purported to be required by Law; or

(f) becomes aware of a Data Loss Event.

14.8 The Processor's obligation to notify under clause 1.5 shall include the provision of further information to the Controller in phases, as details become available.

14.9 Taking into account the nature of the processing, the Processor shall provide the Controller with full assistance in relation to either Party's obligations under Data Protection Legislation and any complaint, communication or request made under clause 1.5 (and insofar as possible within the timescales reasonably required by the Controller) including by promptly providing:

(a) the Controller with full details and copies of the complaint, communication or request;

(b) such assistance as is reasonably requested by the Controller to enable the Controller to comply with a Data Subject Access Request within the relevant timescales set out in the Data Protection Legislation;

(c) the Controller, at its request, with any Personal Data it holds in relation to a Data Subject;

(d) assistance as requested by the Controller following any Data Loss Event;

(e) assistance as requested by the Controller with respect to any request from the Information Commissioner's Office, or any consultation by the Controller with the Information Commissioner's Office.

14.10 The Processor shall maintain complete and accurate records and information to demonstrate its compliance with this clause. This requirement does not apply where the Processor employs fewer than 250 staff, unless:

(a) the Controller determines that the processing is not occasional;

(b) the Controller determines the processing includes special categories of data as referred to in Article 9(1) of the GDPR or Personal Data relating to criminal convictions and offences referred to in Article 10 of the GDPR; and

(c) the Controller determines that the processing is likely to result in a risk to the rights and freedoms of Data Subjects.

14.11 The Processor shall allow for audits of its Data Processing activity by the Controller or the Controller's designated auditor.

14.12 The Processor shall designate a data protection officer if required by the Data Protection Legislation.

14.13 Before allowing any Sub-processor to process any Personal Data related to this Agreement, the Processor must:

(a) notify the Controller in writing of the intended Sub-processor and processing.

(b) obtain the written consent of the Controller;

(c) enter into a written agreement with the Sub-processor which give effect to the terms set out in this clause such that they apply to the Sub-processor; and

(d) provide the Controller with such information regarding the Sub-processor as the Controller may reasonably require.

14.14 The Processor shall remain fully liable for all acts or omissions of any Sub-processor.

14.15 The Controller may, at any time on not less than 30 Working Days' notice, revise this clause by replacing it with any applicable controller to processor standard clauses or similar terms forming part of an applicable certification scheme (which shall apply when incorporated by attachment to this Agreement).

14.16 The Parties agree to take account of any guidance issued by the Information Commissioner's Office. The Controller may on not less than 30 Working Days' notice to the Processor amend this agreement to ensure that it complies with any guidance issued by the Information Commissioner's Office.

14.17 Where the Parties include two or more Joint Controllers as identified in Schedule 12 in accordance with GDPR Article 26, those Parties shall enter into a Joint Controller Agreement based on the terms outlined in Schedule 12a in replacement of Clauses 14.3-14.16 for the Personal Data under Joint Control.

15. INTELLECTUAL PROPERTY RIGHTS

15.1. Save as granted under this Contract, neither the Client nor the Supplier shall acquire any right, title or interest in the other's Pre-Existing Intellectual Property Rights respectively save that each party hereby grants a license to the other party to use its Pre-Existing Intellectual Property Rights to the extent necessary to perform its obligations under this Contract.

15.2. All Intellectual Property Rights that are created by the Supplier in the provision of the Services to the Client shall be proprietary to and owned by the Client and the Supplier shall enter into such documentation and perform such acts as the Client shall request to properly vest such Intellectual Property Rights in the Client. Accordingly, the Supplier hereby assigns (by way of present assignment of future intellectual property rights) all such Intellectual Property Rights.

15.3. The Supplier shall procure that the provision of the Ordered Services shall not infringe any Intellectual Property Rights of any third party.

15.4. The Supplier shall indemnify the Client against all claims, demands, actions, costs, expenses (including legal costs and disbursements on a solicitor and Agency basis), losses and damages arising from or incurred by reason of any infringement or alleged infringement (including the defence of such alleged infringement) of any Intellectual Property Right in connection with the provision of the Ordered Services, except to the extent that such liabilities have resulted directly from the Client failure properly to observe its obligations under this Clause 15.

15.5. Each of the parties shall notify the other if it receives notice of any claim or potential claim relating to the other party's Pre-Existing Intellectual Property Rights

16. CONFIDENTIALITY

16.1. Without prejudice to the application of the Official Secrets Acts 1911 to 1989 to any Confidential Information, the Client and the Supplier acknowledge that any Confidential Information originating from:

a) the Client, its servants or agents is the property of the Client; and

b) the Supplier, its employees, servants or agents is the property of the Supplier.

16.2. The Supplier and the Client shall procure that:

a) any person employed or engaged by them (in connection with this Contract in the course of such employment or engagement) shall only use Confidential Information for the purposes of this Contract;

b) any person employed or engaged by them in connection with this Contract shall not, in the course of such employment or engagement, disclose any Confidential Information to any third party without the prior written consent of the other party;

c) they shall take all necessary precautions to ensure that all Confidential Information is treated as confidential and not disclosed (save as aforesaid) or used other than for the purposes of this Contract by their employees, servants, agents or Sub-Suppliers; and

d) without prejudice to the generality of the foregoing neither the Client nor the Supplier nor any person engaged by them whether as a servant or a consultant or otherwise shall use the Confidential Information for the solicitation of business from the other or from any third party.

16.3. The provisions of Clause 16.1 and Clause 16.2 shall not apply to any information which:

a) is or becomes public knowledge other than by breach of this Clause 16; or

b) is in the possession of the recipient without restriction in relation to disclosure before the date of receipt from the disclosing party; or

c) is received from a third party who lawfully acquired it and who is under no obligation restricting its disclosure; or

d) is independently developed without access to the Confidential Information; or

e) must be disclosed pursuant to a statutory, legal or parliamentary obligation placed upon the party making the disclosure, including any requirements for disclosure under the Freedom of Information Act 2000 or the Environmental Information Regulations 2004.

f) is required to be disclosed by a competent regulatory Agency (including the Law Society or Solicitors Disciplinary Tribunal) or pursuant to any applicable rules of professional conduct.

16.4. Nothing in this Clause 16 shall be deemed or construed to prevent the Client from disclosing any Confidential Information obtained from the Supplier:

a) to any other department, office or agency of Her Majesty's Government ("Crown Bodies"), provided that the Client has required that such information is treated as confidential by such Crown Bodies and their servants, including, where appropriate, requiring servants to enter into a confidentiality agreement prior to disclosure of the Confidential Information and the Client shall have no further liability for breach of confidentiality in respect of the departments, offices and agencies. All Crown Bodies in receipt of such Confidential Information shall be considered as parties to this Contract within Section 1(1) of the Contracts (Rights of Third Parties) Act 1999 for the purpose only of being entitled to further disclose the Confidential Information to other Crown Bodies on such terms; and

b) to any consultant, Supplier or other person engaged by the Client in connection herewith, provided that the Client shall have required that such information be treated as confidential by such consultant, Supplier or other person, together with their servants including, where appropriate, requiring servants to enter into a confidentiality agreement prior to disclosure of the Confidential Information and the Client shall have no further liability for breach of confidentiality in respect of consultants, Suppliers or other people.

16.5. The Supplier shall, prior to commencing any work, enter into a confidentiality undertaking in the form set out in Schedule 7.

16.6. If required by the Client, the Supplier shall procure that any of its Staff or associates enters into a confidentiality undertaking in the form set out in Schedule 7 or such alternative form as the Client may substitute from time to time

16.7. Nothing in this Clause 16 shall prevent the Supplier or the Client from using data Processing techniques, ideas and know-how gained during the performance of this Contract in the furtherance of its normal business, to the extent that this does not relate to a disclosure of Confidential Information or an infringement by the Client or the Supplier of any Intellectual Property Rights.

17. PUBLICITY

17.1. The Supplier shall not make any press announcements or publicise this Contract in any way without the Client's prior written consent.

17.2. Notwithstanding the provisions of Clause 17.1, the Supplier shall be entitled to make any announcement required by any securities exchange or regulatory Agency or government body to which it subscribes whether or not the requirement has the force of law.

18. DISPUTE RESOLUTION

18.1. Subject to the provisions of Clause 18.2, any dispute arising under, or in connection with this Contract shall be dealt with in accordance with this Clause 18, and neither the Client nor the Supplier shall be entitled to commence or pursue any legal proceedings under the jurisdiction of the courts in connection with any such dispute, until the procedures set out in this Clause 18 have been exhausted.

18.2. Clause 18.1 shall be without prejudice to the rights of termination stated in Clause 10 and in addition shall not prevent the Client or the Supplier from applying for injunctive relief in the case of:

a) breach or threatened breach of confidentiality;

b) infringement or threatened infringement of its Intellectual Property Rights; or

c) Infringement or threatened infringement of the Intellectual Property Rights of a third party, where such infringement could expose the Client or the Supplier to liability.

18.3. All disputes between the Client and the Supplier arising out of or relating to any Purchase Order shall be referred by Client's Representative or the nominated head of the Supplier's Accountant Management Team to the other for resolution.

18.4. If any dispute cannot be resolved pursuant to the provisions of Clause 18.3 within ten (10) Working Days either party may refer the dispute to the Client's Head of Procurement for resolution.

18.5. If any dispute cannot be resolved pursuant to the provisions of Clause 18.4 within ten (10) Working Days, then either party may refer the dispute to mediation and if necessary thereafter to the courts in accordance with the provisions of Schedule 6.

19. INSURANCE

19.1. The Supplier shall affect and maintain policies of insurance to provide a level of cover sufficient for all risks which may be incurred by the Supplier under this Contract, including death or personal injury, or loss of or damage to property.

19.2. The Supplier shall hold employer's liability insurance in respect of its employees in accordance with any legal requirement for the time being in force.

19.3. The Supplier shall produce to the Client's Representative, within five (5) Working Days of request, copies of all insurance policies referred to in Clause 19.1 and Clause 19.2 or such other evidence as agreed between the Client and the Supplier that will confirm the extent of the cover given by those policies, together with receipts or other evidence of payment of the latest premiums due under those policies.

19.4. The terms of any insurance or the amount of cover shall not relieve the Supplier of any liabilities under this Contract. It shall be the responsibility of the Supplier to ensure that the amount of insurance cover is adequate to enable it to satisfy all its potential liabilities subject to the limit of liability specified in Clause 13 of this Contract.

20. RECOVERY OF SUMS DUE

20.1. The Client shall be permitted to deduct and withhold from any sum due to the Supplier under this Contract any sum of money due from the Supplier under either:

a) this Contract;

b) any other agreement between the Supplier and the Client;

provided that the terms of such other agreement provide for sums of money due from the Supplier under that agreement to be recovered by way of a deduction from sums of money due to the Supplier under this Contract (albeit that this Contract may not be referenced specifically under that agreement).

21. STATUTORY REQUIREMENTS

21.1. The Supplier shall notify the Client of all statutory provisions and approved safety standards applicable to the Ordered Services and their provision and shall be responsible for obtaining all licenses, consents or permits required for the performance of this Contract.

21.2. The Supplier shall inform the Client if the Ordered Services are hazardous to health or safety and of the precautions that should be taken in respect thereto.

21.3. The Supplier shall, and shall ensure that its personnel, agents and Sub-Suppliers, take all measures necessary to comply with the requirements of the Health and Safety at Work etc. Act 1974 and any other acts, orders, regulations and codes of practice relating to health and safety, which may apply to those involved in the performance of this Contract.

22. STATUTORY INVALIDITY

The Client and the Supplier expressly agree that should any limitation or provision contained in this Contract be held to be invalid under any particular statute or law, or any rule, regulation or bye-law having the force of law, it shall to that extent be deemed to be omitted but, if either the Client or the Supplier thereby becomes liable for loss or damage which would have otherwise been excluded, such liability shall be subject to the other limitations and provisions set out herein.

23. ENVIRONMENTAL REQUIREMENTS

23.1. The Supplier shall comply in all material respects with all applicable environmental laws and regulations in force from time to time in relation to the Services. Without prejudice to the generality of the foregoing, the Supplier shall promptly provide all such information regarding the environmental impact of the Services as may reasonably be requested by the Client.

23.2. The Supplier shall meet all reasonable requests by the Client for information evidencing compliance with the provisions of this Clause 23 by the Supplier.

24. DISCRIMINATION

24.1. The Supplier shall not unlawfully discriminate either directly or indirectly on such grounds as race, colour, ethnic or national origin, disability, sex or sexual orientation, religion or belief, or age and without prejudice to the generality of the foregoing the Supplier shall not unlawfully discriminate within the meaning and scope of the Equality Act 2010, the Human Rights Act 1998 or other relevant or equivalent legislation, or any statutory modification or re-enactment thereof. The Supplier shall take all reasonable steps to secure the observance of this Clause by all Staff.

24.2. The Supplier shall take all reasonable steps to secure the observance of the provisions of Clause 24.1 by any Sub-Supplier(s) employed in the execution of this Contract.

25. SUPPLIER'S SUITABILITY

25.1. The Client reserves the right under this Contract to refuse to admit to any premises occupied by or on behalf of the Client the Supplier, whose admission has become, in the opinion of the Client, undesirable.

25.2. If the Supplier shall fail to comply with Clause 25.1 and if the Client (whose decision shall be final and conclusive) shall decide that such failure is prejudicial to the interests of the State and if the Supplier does not comply with the provisions of Clause 25.1 within a reasonable time of written notice so to do, then the Client may terminate the any Purchase Order provided always that such termination shall not prejudice or affect any right of action or remedy which shall have accrued or shall thereafter accrue to the Client.

26. OFFICIAL SECRETS ACTS

The Supplier shall take all reasonable steps to ensure that he and all people employed by him or his agents and Sub-Suppliers in connection with this Contract are aware of the Official Secrets Act 1989 and where appropriate, with the provisions of the Atomic Energy Act 1946, and that these Acts apply to them during the execution of this Contract and after the expiry or termination of this Contract.

27. CORRUPT GIFTS AND PAYMENTS OF COMMISSION

27.1. The Supplier shall not:

a) offer or give or agree to give any person in Her Majesty's Service any gift or consideration of any kind as an inducement or reward for doing, forbearing to do, or for having done or forborne to do any act in relation to the obtaining or execution of this Contract or any other contract for Her Majesty's Service or for showing favour or disfavour to any person in relation to this or any other contract for Her Majesty's Service;

b) enter into this Contract or any other contract with a person in Her Majesty's Service in connection with which commission has been paid or agreed to be paid by him or on his behalf, or to his knowledge, unless before this Contract are accepted, made particulars of any such commission and of the terms and conditions of any agreement for the payment thereof have been disclosed in writing to the Client.

27.2. Any breach of Clause 27.1 by the Supplier or by anyone employed by him or acting on his behalf (whether with or without the knowledge of the Supplier) or the commission of any offence by the Supplier or by anyone employed by him or acting on his behalf under the Prevention of Corruption Acts 1889 to 1916, in relation to this Contract or any other contract with Her Majesty's Service shall entitle the Client to terminate any Purchase Order and recover from the Supplier the amount of any direct loss resulting from such termination and/or to recover from the Supplier the amount or value of any such gift, consideration or commission.

27.3. Any dispute, difference or question arising in respect of the interpretation of this Clause 27, the right of the Client to terminate any Purchase Order or the amount or value of any such gift, consideration or commission shall be decided by the Client, whose decision shall be final and conclusive.

27.4. Either Party may terminate this contract and recover all its losses if the other Party, their employees or anyone acting on their behalf:

a. Corruptly offers, gives or agrees to give to anyone any inducement or reward in respect of this Contract; or

b. Commits an offence under the Bribery Act 2010.

28. TRANSFER AND SUB-CONTRACTING

28.1. Sub-contracting will be allowed, subject to written authorisation from the Client.

28.2. The Client shall be entitled to nominate sub-Suppliers at its discretion.

28.3. The Supplier shall be entitled to Sub-Contract its obligations under this Contract, or any resultant Purchase Order, solely with the express permission of the Client Representative; such permission shall not be unreasonably withheld.

28.4. Any sub-contract must allow for full disclosure under 'transparency' requirements.

28.5. The Client shall be entitled to assign or otherwise dispose of its rights and obligations under this Contract and/or any relevant Purchase Order to any other body (including any private sector body) which substantially performs any of the functions that previously had been performed by the Client.

29. RIGHTS OF THIRD PARTIES

29.1. To the extent that this Contract are expressed to confer rights or benefits on a party who is not a party to this Contract, that party shall by virtue of the Contracts (Rights of Third Parties) Act 1999, be entitled to enforce those rights as if it was a party to this Contract. For the avoidance of doubt the consent of any person other than the Client (or the Supplier, as the case may be) is not required to vary or terminate this Contract.

29.2. Except as provided in Clause 29.1, a person who is not a party to this Contract shall have no rights under the Contracts (Rights of Third Parties) Act 1999 to enforce any term of this Contract. This Clause 29.2 does not affect any right or remedy of any person that exists or is available otherwise than pursuant to that Act.

30. CLIENT PROPERTY

30.1. All Client Property shall remain the property of the Client and shall be used only for the purposes of the Contract.

30.2. The Supplier undertakes the safe custody of and the due return of all Client Property and shall be responsible for all reasonably foreseeable loss thereof from whatever cause and shall indemnify the Client against such loss.

30.3. Neither the Supplier, nor any Sub Supplier nor any other person shall have a lien on any Client Property for any sum due to the Supplier, Sub Supplier or other person and the Supplier shall take all reasonable steps to ensure that the title of the Client and the exclusion of any such lien are brought to the notice of all Sub Suppliers and other persons dealing with any Client Property

31. SEVERABILITY

Subject to the provisions of Clause22, if any provision of this Contract is held invalid, illegal or unenforceable for any reason, such provision shall be severed and the remainder of the provisions hereof shall continue in full force and effect as if this Contract had been accepted with the invalid provision eliminated. In the event of a holding of invalidity so fundamental as to prevent the accomplishment of the purpose of this Contract, the Client and the Supplier shall immediately commence good faith negotiations to remedy such invalidity.

32. FREEDOM OF INFORMATION

32.1. The Supplier acknowledges that the Client is subject to the requirements of the Code of Practice on Government Information, FOIA and the Environmental Information Regulations and shall assist and cooperate with the Client to enable the Client to comply with its Information disclosure obligations.

32.2. The Supplier shall, and shall procure that its Sub-Suppliers shall:

- transfer to the Client all Requests for Information that it receives as soon as practicable and in any event within two Working Days of receiving a Request for Information;
- provide the Client with a copy of all Information in its possession, or power in the form that the Client requires within five Working Days (or such other period as the Client may specify) of the Client's request; and
- provide all necessary assistance as reasonably requested by the Client to enable the Client to respond to the Request for Information within the time for compliance set out in section 10 of the FOIA or regulation 5 of the Environmental Information Regulations.

32.3. The Client shall be responsible for determining in its absolute discretion and notwithstanding any other provision in this Contract or any other contract whether the Commercially Sensitive Information and/or any other information is exempt from disclosure in accordance with the provisions of the Code of Practice on Government Information, FOIA or the Environmental Information Regulations.

32.4. In no event shall the Supplier respond directly to a Request for Information unless expressly authorised to do so by the Client.

32.5. The Supplier acknowledges that (notwithstanding the provisions of Clause 42 – Transparency, the Client may, be obliged under the FOIA, or the Environmental Information Regulations to disclose information concerning the Supplier or the Services:

- in certain circumstances without consulting the Supplier; or
- following consultation with the Supplier and having taken their views into account;

provided always that where [reference] applies the Client shall, in accordance with any recommendations of the Code, take reasonable steps, where appropriate, to give the Supplier advanced notice, or failing that, to draw the disclosure to the Supplier's attention after any such disclosure.

32.6. The Supplier shall ensure that all Information is retained for disclosure and shall permit the Client to inspect such records as requested from time to time.

32.7. The Supplier acknowledges that the Commercially Sensitive Information listed in Schedule 9 (if any) is of indicative value only and that the Client may be obliged to disclose it in accordance with clause 32.

33. FORCE MAJEURE

33.1. For the purposes of this Contract the expression "Force Majeure" shall mean any cause affecting the performance by either the Client or the Supplier of its obligations arising from acts, events, omissions, happenings or non-happenings beyond its reasonable control including (but without limiting the generality thereof) governmental regulations, fire, flood, or any disaster or an industrial dispute affecting a third party for which a substitute third party is not reasonably available. Any act, event, omission, happening or non-happening will only be considered Force Majeure if it is not attributable to the willful act, neglect or failure to take reasonable precautions of the affected party, its employees, servants or agents or the failure of either the Client or the Supplier to perform its obligations under any Purchase Order.

33.2. It is expressly agreed that any failure by the Supplier to perform or any delay by the Supplier in performing its obligations under any Purchase Order which results from any failure or delay in the performance of its obligations by any person, firm or company with which the Supplier shall have entered into any contract, supply arrangement or Sub-Contract or otherwise shall be regarded as a failure or delay due to Force Majeure only in the event that such person firm or company shall itself be prevented from or delayed in complying with its obligations under such Purchase Order, supply arrangement or Sub-Contract or otherwise as a result of circumstances of Force Majeure.

33.3. Both the Client and the Supplier agree that any acts, events, omissions, happenings or non-happenings resulting from the adoption of the Euro by the United Kingdom government shall not be considered to constitute Force Majeure under this Contract.

33.4. Neither the Client nor the Supplier shall in any circumstances be liable to the other for any loss of any kind whatsoever including but not limited to any damages or abatement of Charges whether directly or indirectly caused to or incurred by the other party by reason of any failure or delay in the performance of its obligations which is due to Force Majeure. Notwithstanding the foregoing, both the Client and the Supplier shall use all reasonable endeavors to continue to perform, or resume performance of, (and having resumed to catch up to the required level of performance existing immediately prior to the Force Majeure event), such obligations hereunder for the duration of such Force Majeure event.

33.5. If either the Client or the Supplier become aware of circumstances of Force Majeure which give rise to or which are likely to give rise to any such failure or delay on its part it shall forthwith notify the other by the most expeditious method then available and shall inform the other of the period which it is estimated that such failure or delay shall continue.

33.6. It is hereby expressly declared that the only events that shall afford relief from liability for failure or delay shall be any event qualifying for Force Majeure hereunder.

34. LEGISLATIVE CHANGE

34.1. The Supplier shall bear the cost of ensuring that the Ordered Services shall comply with all applicable statutes, enactments, orders, regulations or other similar instruments and any amendments thereto, except where any such amendment could not reasonably have been foreseen by the Supplier at the date hereof.

34.2. Where such reasonably unforeseeable amendments are necessary, the Client and the Supplier shall use all reasonable endeavors to agree upon reasonable adjustments to the Charges as may be necessary to compensate the Supplier for such additional costs as are both reasonably and necessarily incurred by the Supplier in accommodating such amendments.

35. CONFLICTS OF INTEREST

The Supplier shall disclose to the Client's Representative as soon as is reasonably practical after becoming aware of any actual or potential conflict of interest relating to provision of the Services by the Supplier or any event or matter (including without limitation its reputation and standing) of which it is aware or anticipates may justify the Client taking action to protect its interests.

36. ASSIGNED STAFF

36.1. As soon as the Supplier becomes aware of any intended changes to the Account Management Team, they shall inform the Client Representative.

36.2. The Client may require the Supplier to attend a meeting and/or submit written notification of the steps it intends to take to mitigate any issues which may result from such changes.

37. INVESTIGATIONS

The Supplier shall immediately notify the Client Representative in writing if any investigations are instituted unto the affairs of the Supplier, its partners or key managers under the Companies, Financial Services or Banking Acts, or in the event of any police or Serious Fraud Office enquiries, enquires into possible fraud, any involvement in DTI investigations or any investigations by the Office for the Supervision of Solicitors which might result in public criticism of the Supplier.

38. STATUTORY AUDITORS' ACCESS

For the purposes of the examination and certification of the Client accounts or any examination, pursuant if appropriate to Section 6(1) of the National Audit Act 1983 or any re-enactment thereof, or pursuant to any equivalent legislation, of the economy, efficiency and effectiveness with which the Client has used its resources, the Client's statutory auditors may examine such documents as they may reasonably require which are owned, held or otherwise within the control of the Supplier and may require the Supplier to produce such oral or written explanations as they consider necessary. For the avoidance of doubt, it is hereby declared that the carrying out of an examination, if appropriate, under section 6(3) (d) of the National Audit Act 1983 or any re-enactment thereof, or under any equivalent legislation, in relation to the Supplier is not a function exercisable under this clause 38.

39. ELECTRONIC INSTRUCTION

The Supplier shall use its reasonable endeavors to interface with any system introduced by the Client for issuing electronic instructions, in particular the FSA's Purchase Order system, and to accept such instruction.

40. WAIVER

40.1. The failure of the Supplier or the Client to insist upon strict performance of any provision of this Contract or to exercise any right or remedy to which it is entitled hereunder, shall not constitute a waiver thereof and shall not cause a diminution of the obligations established by this Contract.

40.2. A waiver of any default shall not constitute a waiver of any other default.

40.3. No waiver of any of the provisions of this Contract shall be effective unless it is expressed to be a waiver communicated by notice, in accordance with the provisions of Clause9.

41. LAW AND JURISDICTION

Subject to the provisions of Clause 18, the Client and the Supplier accept the exclusive jurisdiction of the English and Welsh courts and agree that this Contract is to be governed by and construed according to the law of England and Wales.

42. TRANSPARENCY

42.1. The Parties acknowledge that, except for any information which is exempt from disclosure in accordance with the provisions of the FOIA, the content of these Terms and Conditions and any Purchase Order is not Confidential Information.

42.2. The Client shall be responsible for determining in its absolute discretion whether any content of any Purchase Order is exempt from disclosure in accordance with the provisions of the FOIA. Notwithstanding any other term of these Terms and Conditions, the Supplier gives his consent for the Client to publish any Contract or Purchase Order in its entirety, (but with any information which is exempt from disclosure in accordance with the provisions of the FOIA redacted), to the general public.

42.3. The Client may consult with the Supplier to inform its decision regarding any redactions but the Client shall have the final decision in its absolute discretion.

43. SECURITY PROVISIONS

Supplier Personnel – Staffing Security

43.1 The Supplier shall comply with the staff vetting procedures in respect of all Supplier Personnel employed or engaged in the provision of the Services. The Supplier confirms that all Supplier Personnel employed or engaged by the Supplier at the Effective Date were vetted and recruited on such a basis that is equivalent to and no less strict than the Staff Vetting procedures as laid out by Cabinet Office: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/200551/HMG_Baseline_Personnel_Security_Standard_V3_2_Apr-2013.pdf

43.2 The Supplier shall provide training on a continuing basis for all Supplier Personnel employed or engaged in the provision of the Services in compliance with the Security Policy – Table of Policies – See Annex D.

43.3 The Supplier agrees to conform to the below standards as directed by the Client:

Baseline Standard

a) The **Baseline Standard** is not a formal security clearance but aims to provide an appropriate level of assurance as to the trustworthiness, integrity and probable reliability of prospective **Suppliers** and/or their **Staff**.
b) It should be applied to all private sector **Employees** working on government **Contract**s (e.g. **Suppliers** and consultants), who require access to the **Agency**'s premises, or knowledge or custody of, government assets protectively marked up to and including CONFIDENTIAL.
c) The outcome of checks should be recorded on the **Baseline Standard Verification Record**. This will be carried out by the **Agency's Representative.**

Enhanced Baseline Standard

Some **Contracts** may require the **Baseline Standard** to be supplemented with additional checks (e.g. a Criminal Record Check (including spent convictions) or a Credit Worthiness Check). A Criminal Record Check could take up to 2 **Weeks** to process.

43.4 The Baseline Standard comprises verification of the following four main elements:
a) Identity

b) Employment history (past 3 years)
c) Nationality and Immigration Status
d) Criminal record (unspent convictions only)

43.5 Additionally, Suppliers and their staff are required to give a reasonable account of any significant periods (6 months or more in the past 3 years) of time spent abroad.

43.6 Verification of identity is essential before any individual can begin working on the Client's premises or have access to assets/documents as described above. Before a contract is awarded Suppliers and their staff who will work on the Client's premises or have access to assets/documents as described above will be asked to provide the following:

a) Confirmation of name, date of birth and address. (ID should be corroborated by original documents i.e. full passport, national ID card, current UK full driving license, birth certificate, bank correspondence or utility bills.)

b) National insurance number or other unique personal identifying number where appropriate.

c) Full details of previous employers (name, address and dates), over the past 3 years.

d) Confirmation of any necessary qualifications/licences.

e) Educational details and references where someone is new to the workforce.

f) Confirmation of permission to work in the UK if appropriate.

43.7 Client Data

a) The Supplier shall not delete or remove any proprietary notices contained within or relating to the Client Data.

b) The Supplier shall not store, copy, disclose, or use the Client Data except as necessary for the performance by the Supplier of its obligations under this Contract or as otherwise expressly authorised in writing by the Client.

43.8 To the extent that Client Data is held and/or processed by the Supplier, the Supplier shall supply that Client Data to the Client as requested by the Client in the format specified herein:

43.9 The Supplier shall take responsibility for preserving the integrity of Client Data and preventing the corruption or loss of Client Data.

43.10 The Supplier shall perform secure back-ups of all Client Data and shall ensure that up-to-date back-ups are stored off-site in accordance with the Business Continuity

and Disaster Recovery Plan. The Supplier shall ensure that such back-ups are available to the Client at all times upon request and are delivered to the Client at no less than monthly intervals.

43.11 The Supplier shall ensure that any system on which the Supplier holds any Client Data, including back-up data, is a secure system that complies with the Security Policy.

43.12 If the Client Data is corrupted, lost or sufficiently degraded as a result of the Supplier's Default so as to be unusable, the Client may:

- require the Supplier (at the Supplier's expense) to restore or procure the restoration of Client Data to the extent and in accordance with the requirements specified in herein and the Supplier shall do so as soon as practicable but not later than two working days; and/or
- itself restore or procure the restoration of Client Data, and shall be repaid by the Supplier any reasonable expenses incurred in doing so to the extent and in accordance with the requirements specified herein

43.13 If at any time the Supplier suspects or has reason to believe that Client Data has or may become corrupted, lost or sufficiently degraded in any way for any reason, then the Supplier shall notify the Client immediately and inform the Client of the remedial action the Supplier proposes to take.

Security Requirements

43.14 The Supplier shall comply, and shall procure the compliance of the Supplier Personnel, with the Security Policy (see Table of Policies – See Annex D) and the Supplier shall ensure that the Security Plan produced by the Supplier fully complies with the Security Policy.

43.15 The Client shall notify the Supplier of any changes or proposed changes to the Security Policy.

43.16 If the Supplier believes that a change or proposed change to the Security Policy will have a material and unavoidable cost implication to the Services it may submit a Change Request. In doing so, the Supplier must support its request by providing evidence of the cause of any increased costs and the steps that it has taken to mitigate those costs. Any change to the Charges shall then be agreed in accordance with the Change Control Procedure.

43.17 Until and/or unless a change to the Charges is agreed by the Client pursuant to clause 43 the Supplier shall continue to perform the Services in accordance with its existing obligations.

Malicious Software

43.18 The Supplier shall, as an enduring obligation throughout the Term, use the latest versions of anti-virus definitions available from an industry accepted anti-virus

software vendor to check for and delete Malicious Software from the ICT Environment.

43.19 Notwithstanding clause 43, if Malicious Software is found, the parties shall co-operate to reduce the effect of the Malicious Software and, particularly if Malicious Software causes loss of operational efficiency or loss or corruption of Client Data, assist each other to mitigate any losses and to restore the Services to their desired operating efficiency.

43.20 Any cost arising out of the actions of the parties taken in compliance with the provisions of clause 43 shall be borne by the parties as follows.

- by the Supplier where the Malicious Software originates from the Supplier Software, the Third-Party Software or the Client Data (whilst the Client Data was under the control of the Supplier); and
- by the Client if the Malicious Software originates from the Client Software or the Client Data (whilst the Client Data was under the control of the Client);

Warranties

43.21 The Supplier warrants, represents and undertakes for the duration of the Term that all personnel used to provide the Services will be vetted in accordance with good industry practice and the Supplier's usual staff vetting procedures.

44. ACCEPTANCE TESTING IS NOT APPLICABLE

45. EXIT MANAGEMENT

45.1. On receipt of notice to terminate this Contract or a Purchase Order or expiration of this Contract or a Purchase Order, however and whenever occurring, the Parties shall comply with the Exit Management Requirements as may be set out in any appropriate Purchase Order.

45.2. During the Exit Period the Charges shall continue to apply, even where the Exit Period continues after the expiry of the Term.

45.3. In order to facilitate the Exit Management Requirements, the Supplier shall, if requested by the Client to do so, extend the Term of this Contract or a Purchase Order.

45.4. No right or licence is granted to either Party or their advisers in relation to any Confidential Information except as expressly set out in this Contract.

46. ENTIRE AGREEMENT

This Contract constitutes the entire understanding between the Client and the Supplier relating to the subject matter.

46.1. Neither the Client nor the Supplier has relied upon any representation or promise except as expressly set out in this Contract.

46.2. Both the Client and the Supplier unconditionally waives any rights it may have to claim damages against the other on the basis of any statement made by the other (whether made carelessly or not) not set out or referred to in this Contract (or for breach of any warranty given by the other not so set out or referred to) unless such statement or warranty was made or given fraudulently.

46.3. Both the Client and the Supplier unconditionally waives any rights it may have to seek to rescind this Contract on the basis of any statement made by the other (whether made carelessly or not) whether or not such statement is set out or referred to in this Contract unless such statement was made fraudulently.

This contract is deemed to have commenced at the date given on page 1.

Signed for and on behalf of the **Foods Standards Agency**:

Signed for and on behalf of Ausvet Europe SAS**:**

SCHEDULE 1

INTERPRETATIONS

Account Management Team	The Supplier's personnel who have been designated as their point(s) of contact for management of this contract
Agreement	means this contract
Client Property	means anything issued or otherwise furnished in connection with the Contract by or on behalf of the Client, other than any real property.
Client's Representative	means the member of the Client staff who shall be the main contact point under the Contract or any relevant Purchase Order
Charges	means charges payable by the Client to the supplier for the performance of the Services, which must be itemised in full on any relevant Purchase Order
Confidential Information	means any information, however it is conveyed, that relates to the business, affairs, developments, trade secrets, know-how, personnel and suppliers of either party, including Intellectual Property Rights, together with all information derived from the above, and any other information clearly designated as being confidential (whether or not it is marked as "confidential") or which ought reasonably to be considered to be confidential.
Supplier Personnel	means all directors, officers, employees, agents, consultants and Suppliers of the Supplier and/or of any Sub-Supplier engaged in the performance of its obligations under this Agreement.
Controller, Processor, Data Subject, Personal Data, Personal Data Breach, Data Protection Officer	take the meaning given in the GDPR

Data Loss Event	means any event that results, or may result, in unauthorised access to Personal Data held by the Supplier under this Agreement, and/or actual or potential loss and/or destruction of Personal Data in breach of this Agreement, including any Personal Data Breach
Data Protection Impact Assessment	means an assessment by the Controller of the impact of the envisaged processing on the protection of Personal Data.
Data Protection Legislation	(i) the GDPR, the LED and any applicable national implementing Laws as amended from time to time (ii) the DPA 2018 [subject to Royal Assent] to the extent that it relates to processing of personal data and privacy; (iiii) all applicable Law about the processing of personal data and privacy.
Data Protection Requirements	mean the Data Protection Act 1998, the EU Data Protection Directive 95/46/EC, the Regulation of Investigatory Powers Act 2000, the Telecommunications (Lawful Business Practice) (Interception of Communications) Regulations 2000 (SI 2000/2699), the Electronic Communications Data Protection Directive 2002/58/EC, the Privacy and Electronic Communications (EC Directive) Regulations 2003 and all applicable laws and regulations relating to processing of personal data and privacy, including where applicable the guidance and codes of practice issued by the Information Commissioner.
Data Subject Access Request	means a request made by, or on behalf of, a Data Subject in accordance with rights granted pursuant to the Data Protection Legislation to access their Personal Data.
Default	means any breach of the obligations of any party (including but not limited to fundamental breach or breach of a fundamental term) or any default, act, omission, negligence or statement of any party, it's employees, agents or Sub-Suppliers in connection with or in relation to the subject matter of this Contract and in respect of which such party is liable to the other.
DPA 2018	Data Protection Act 2018

Environmental Information Regulations	mean the Environmental Information Regulations 2004 and any guidance and/or codes of practice issued by the Information Commissioner in relation to such regulations.
Equipment	means any computers, laptops, servers, networks, internet broadband, wireless or other connections, other computer associated equipment or presentation equipment
FOIA	means the Freedom of Information Act 2000 and any subordinate legislation made under this Act from time to time together with any guidance and/or codes of practice issued by the Information Commissioner in relation to such legislation.
GDPR	the General Data Protection Regulation (Regulation (EU) 2016/679)
Government Accounting	means HM Treasury's manual of accounting principles for government as updated from time to time
Government Procurement Card (GPC)	means the UK Government's VISA purchasing card.
Industry Regulator	means any statutory or non-statutory body with responsibility for regulating (or promoting self regulation) of the provision on the type of services being provided by the Supplier.
Information	has the meaning given under section 84 of the Freedom of Information Act 2000.
Intellectual Property Rights	means patents, trademarks, service marks, design rights (whether registerable or otherwise), applications for any of the foregoing, copyright, database rights, trade or business names and other similar rights or obligations whether registerable or not in any country (including but not limited to the United Kingdom).
Invoicing Procedure	means the procedure by which the Supplier invoices the Client, as set out in Schedule 5.
Joint Controllers	where two or more Controllers jointly determine the purposes and means of processing.

Law	means any law, subordinate legislation within the meaning of Section 21(1) of the Interpretation Act 1978, bye-law, enforceable right within the meaning of Section 2 of the European Communities Act 1972, regulation, order, regulatory policy, mandatory guidance or code of practice, judgment of a relevant court of law, or directives or requirements with which the Supplier is bound to comply.
LED	Law Enforcement Directive (Directive (EU) 2016/680)
Mediator	has the meaning ascribed to it in Schedule 6.
Month	means a calendar month and "Monthly" shall be similarly construed.
Nominated Sub-Supplier	means any sub-Supplier engaged by the Supplier, at the direction of the Client, in connection with the provision of Ordered Services
Ordered Services	means the services which the Client has instructed the Supplier to carry out in any Purchase Order, subject to Schedule 2.
Party	means a Party to this Agreement
Personal Data	shall have the same meaning as set out in the Data Protection Act 1998.
Pre-Existing Intellectual Property Rights	shall mean any Intellectual Property rights vested in or licensed to the Supplier or Client prior to or independently of the performance by the Supplier or Client of their obligations under this Contract.
Private Agency	means a commercial organisation to which service provision has been outsourced by a Contracting Agency, which assumes the role and responsibilities of the Agency under a Contract.
Processor Personnel	means all directors, officers, employees, agents, consultants and contractors of the Processor and/or of any Sub-Processor engaged in the performance of its obligations under this Agreement.

Protective Measures	means appropriate technical and organisational measures which may include: pseudonymising and encrypting Personal Data, ensuring confidentiality, integrity, availability and resilience of systems and services, ensuring that availability of and access to Personal Data can be restored in a timely manner after an incident, and regularly assessing and evaluating the effectiveness of the such measures adopted by it including those outlined in Schedule [x] (Security).
Purchase Order	means an order for Services served by the Client on the Supplier by means of the Client's i-Procurement system
Quarter	means a three (3) month period beginning on 1st January 1st April, 1st July or 1st October. The term 'Quarterly' shall be similarly construed.
Regulatory Body	means those government departments and regulatory, statutory and other entities, committees and bodies which, whether under statute, rules, regulations, codes of practice or otherwise, are entitled to regulate, investigate, or influence the matters dealt with in this Contract or any other affairs of the Client and "Regulatory Body" shall be construed accordingly.
Requests for Information	means a request for information or an apparent request under the Code of Practice on Access to Government Information, FOIA or the Environmental Information Regulations.
Services	means services which the Supplier has agreed to provide under any Purchase Order.
Special Terms	means additional Client specific terms, to which the Supplier's has agreed
Specific Obligations	means any obligations entered at Schedule 3
Staff	means employees, agents and Suppliers of the Supplier
Sub-Supplier	means any sub-Supplier engaged by the Supplier in connection with the provision of Ordered Services.
Sub-Processor	means any third Party appointed to process Personal Data on behalf of that Processor related to this Agreement

Supplier	The person identified in the Contract their employees, agents or any other persons under the control of the Supplier
Working Days	means Monday to Friday inclusive, excluding English public and bank holidays.
Year	means a calendar year.

SCHEDULE 2

THE ORDERED SERVICES

1. INTRODUCTION

This Schedule 2 specifies the Ordered Services to be provided to the Client by the Supplier in the services required for FS307037.

THE SPECIFICATION, INCLUDING PROJECT TIMETABLE

GENERAL INTRODUCTION

The Food Standards Agency is an independent Government department working across England, Wales and Northern Ireland to protect public health and consumers wider interest in food. We make sure food is safe and what it says it is.

The Agency is committed to openness, transparency and equality of treatment to all suppliers. As well as these principles, for science projects the final project report will be published on the Food Standards Agency website (www.food.gov.uk). For science projects we will encourage contractors to publish their work in peer reviewed scientific publications wherever possible. Also, in line with the Government's Transparency Agenda which aims to encourage more open access to data held by government, the Agency is developing a policy on the release of underpinning data from all of its science- and evidence-gathering projects. Data should be made freely available in an accessible format, as fully and as promptly as possible. Consideration should be given to data management as new contracts are being negotiated. Resource implications for this should be taken into account. The mechanism for publishing underpinning data should allow the widest opportunity for to enable its re-use. Where possible, underpinning data should be included in the final project report. Where data are included in the final report in pdf format, they should also be published separately in a format that can be used for further analysis. Large data sets can be provided separately in an annex to the report, and published, where possible, alongside the final report online Where it is more appropriate to publish underpinning data in an existing database, archive, repository or other community resource, or for data to be saved in a specialist proprietary format, information will be provided on how the data can be accessed. There will be some circumstances where release of data may need to be restricted or anonymised for reasons of commercial and/or personal sensitivities.

The objective of the microbiological food safety research themes is to provide robust information on the presence, growth, survival and elimination of pathogenic microorganisms throughout the food chain; the extent, distribution, causes, risks and cost of foodborne disease will also be considered where appropriate.

The main objective from the FSA's Strategic Plan for 2015-2020 is to protect public health from risks which may arise in connection with the consumption of food (including risks caused by the way in which it is produced or supplied) and otherwise to protect the interest of consumers in relation to food. This would include the reduction of foodborne disease to ensure 'food is safe'.

The 2019 5-year national action plan calls for activities to "identify and assess the sources, pathways, and exposure risks" of AMR. Exposure to AMR genes can also occur through food, and this is dependent on the food chain. The proposed study will build quantitative AMR risk assessment models for key food chains, poultry and leafy greens, through the development of modular templates for key stages in the food chain. This will enable more efficient and reproducible AMR quantitative risk assessment as quantitative assessments of relevant steps in the food chain are available "off the shelf".

A. THE SPECIFICATION

Background

Antimicrobial resistance (AMR) is a global threat to public health. It is a complex issue driven by a variety of interconnected factors enabling microorganisms to survive antimicrobial treatments thus making such infections more difficult to treat. Unless urgent action is taken to reduce AMR globally, the number of deaths caused by AMR is predicted to increase to an estimated 10 million each year by 2050 (O'Neill Report, 2014). Addressing the public health threat posed by AMR is a national strategic priority for the UK. It has led to the Government publishing both a 20-year vision of AMR and a 5-year (2019 to 2024) AMR National Action Plan (NAP) which sets out actions to slow the development and spread of AMR with a focus on reduction in the use of antimicrobials. The NAP uses a 'One-Health' approach which spans people, animals, agriculture, the environment and food and calls for activities to "identify and assess the sources, pathways, and exposure risks" of AMR. The FSA has contributed and is continuing to contribute to the delivery of a specific section on food safety within the NAP through improving our understanding of the role that the food chain plays in the development and spread of AMR bacteria and resistance genes. We are also promoting and improving UK food hygiene ('4Cs' messages) across the food chain which would reduce exposure to AMR bacteria. AMR genes that result in resistance to critically important antimicrobials are of particular concern to the FSA.

To strengthen the evidence base for AMR in the food chain, the FSA has funded multi-year surveillance of AMR bacteria (both pathogenic and commensal) detected in a range of raw fresh meats sold at retail in the UK including chicken, beef and pork (FS102109 and FS102121). This provides robust data to monitor the trends, emergence, spread and decline of AMR within these foods. We have also been active in funding AMR-related research which includes the 2016 publication of a systematic review of the prevalence of AMR

bacteria in a range of UK retail foods including pork, chicken, dairy products, seafood and fresh produce (FS102127). We are currently funding two AMR-related research projects: a critical review of the impact of food processing on AMR bacteria in meats and meat products (FS301059) and a separate study which is using sequencing techniques to estimate the burden and diversity of AMR genes found in selected ready-to-eat (RTE) foods (FS301050). However, this and data from the wider literature have yet to be used to create tools for aiding in the quantitative risk assessment of AMR in the food chain.

At the FSA, we provide both qualitative and quantitative risk assessments for the risk to consumers of foodborne hazards to consumers. The Microbiological Risk Assessment team focuses on microbial risk in food, including that of antimicrobial resistance, and is required to provide microbial risk assessments with a quick turnaround and therefore it would be beneficial to have off-the-shelf tools to aid us. The use of quantitative risk assessments is becoming increasingly important, with literature highlighting the need for quantitative risk assessment of AMR in the food chain, notably those of fresh produce and poultry (Hölzel et al. 2018) but due the complex nature of AMR, providing quantitative AMR risk assessments can be both time-consuming and labour-intensive. To assist with the creation of quantitative risk assessments in the short timescales required, there is a need to develop easily adaptable 'off-the-shelf' modular farm-to-fork AMR templates for key products and production processes such as for AMR bacteria in poultry and fresh produce. Doing so will allow for the efficient creation of reproducible risk assessments of AMR and allow the FSA to remain at the forefront of food safety in the world.

The Specification

Tenders are invited to undertake a literature review to establish the relevance of primary literature, and to use the information gathered, in addition to data from previous published FSA studies, to build modular food chain specific models for the quantitative risk assessment of AMR risk.

Overview

The proposed study will scope the literature to allow for the creation of a set of modular templates of risk of AMR within the chicken and lettuce supply chain, focusing on all the processing stages, such as metaphylactic administration of antibiotics to poultry, transport to abattoirs, processing of meat at cutting plants, industrial washing of lettuces, to name a few. Consultation with industry is encouraged, in order to achieve a thorough understanding of the farm-to-fork processes for chicken and lettuce and develop an appropriate model applicable to a range of real-world processes in use. The information on pathways and the collected quantitative data will be used in the subsequent creation of food chain specific models to analyse the probability of risk within these foods. These models will be required in a modular user-editable form with the inclusion of graphical user

interface, and include comprehensive annotation, to allow for their adaption to new and emerging risks, such as different pathogens and different food – other poultry, meat or fresh produce.

The challenge is to develop flexible modules that can be used off the shelf with minimum to no modification needed once adapted and include a user-friendly interface to allow non-experts to use and input key data into the model. All models produced will also be required to include comprehensive annotation and additional training materials, allowing for their adaption when needed for new and emerging risks, and consideration should be given to the information needed to allow these models to be adapted to suit other food chains. The models should therefore also be flexible in terms of the training/input data that users can upload to assess risk.

This work will enable the production of more efficient and reproducible AMR risk assessments as relevant steps in the food chain are available "off the shelf" and will allow the FSA to facilitate collaborative working and inform more complex, multi-factorial risk assessments. The use of these models will also allow for better prioritisation of risk management interventions, establishment of better food production techniques to limit the spread of AMR and promote good practice in the food chain.

The information delivered by this work is key to supporting the FSA's risk assessment work on AMR. It will enable the FSA to provide quantitative risk assessments examining the risk of AMR within foods which will help support consumer advice.

Details

Proposals submitted **must include** the following key elements:

- An outline of how applicant(s) plan to gather information to assess i) what the key modules for each food chain (chicken / lettuce) are from farm / field to consumer via a supermarket/market route, including information on but not limited to processing stages, pathogen presence, AMR presence, growth and removal. ii) what data would be needed at each step and key parameters needed to subsequently calculate the risk of exposure to AMR genes. This may include a review of grey and scientific literature, review of industry HACCP or industry elicitation workshops to ensure expertise in AMR and relevance to current industrial food processes. A meeting will be held with the FSA to present this data prior to undertaking full writing of the model.

- The proposal should suggest the microorganisms and AMR genes that will be considered within the model, providing a clear rationale for the choice for subsequent discussion and adaptation to suit the FSAs needs.

- Use of appropriate methods and languages to build models plus additional graphical user interfaces to assess the probabilistic risk of AMR in the chicken and lettuce production chains, from field/farm to supermarket to fork, and should be able to be adapted to emerging risks. The FSA is predominantly interested in models built in R or @RISK, although contractors should provide the rationale for the methods and languages chosen for discussion. The modelling should account for uncertainties in parameters and processing steps.

- Explanation of the process of quality assurance and full version history of any software or software packages used to allow reproducibility of result

- Production of a final report to present the data used in the model, the model itself and address where further work would have the most impact on the reliability of the model results.

- User guides and appropriate annotation of the code underlying models will need to be provided allowing for the FSA to use and adapt the models as needed. All the data used in the model should also be provided, together with references.

- Appropriate training for members of staff within the FSA must be provided during and after the production of the model before the end of the project.

- The researcher(s) need to prove knowledge of modelling techniques, AMR, microbiology and food chain processes (although this may include findings from a literature review or industry working groups).

- Publication of results is encouraged and should be published in an open source publication.

- Contractors should outline the anticipated outputs and benefits from the proposed methodologies within their proposal.

Outcomes

It is anticipated that the following will be delivered to the FSA as part of this work:

Information on the key modules, and data required to assess these stages, required to build a robust model. This will be done for chicken and lettuce food chains – although parallels should be highlighted in other food chains.

- An important sense check on the risk management of AMR in the food chain, highlighting key risk points through the production of a modular template of key stages of AMR risk the food chain.

- Two (chicken and lettuce) modular off the shelf quantitative risk assessment models, inclusive of graphical user interface and thorough annotation, plus provision of user guides outlining the information needed to adapt the model.

- A full technical report addressing the relevant areas of the study which is in a format suitable for publication on the FSA website. The report will need to include a lay summary, executive summary, introduction (including the background and aims/objectives of the research), methodology, findings, discussions (including the limitations of the models created), conclusions, references and recommendations for further work. Please note that the final report should be submitted by January 2022 and will undergo a peer-review process before it can be accepted by the FSA. A draft report should be submitted at least four or five weeks before the final report is due to allow FSA officials sufficient time to comment. In addition to the normal peer review of the report, Quality assurance in the form of additional internal or external review of the resulting model(s) may be arranged by FSA, in accordance with the Aqua Book government guidance for producing quality analysis for government.

- Full details of the data collected in a systemised format and a library of references organised using an appropriate reference management system.

- Publication of research findings in the peer reviewed literature and presentations at scientific conferences are encouraged by the FSA. Such material will need to be approved by the FSA prior to submission.

- A meeting with FSA officials to discuss the models and give a demonstration and training session for staff at the FSA.

- If appropriate, to attend a future ACMSF and other FSA meetings where the project lead will give a presentation on the study findings.

Collaborative applications with an appropriate management framework are encouraged to promote well-balanced, innovative proposals that offer value for money and make use of the best available research and analytical approaches.

References

O'Neill, (2014), Antimicrobial Resistance: Tackling a crisis for the health and wealth of nations https://amr-review.org/

Hölzel CS, Tetens JL, Schwaiger K. Unraveling the Role of Vegetables in Spreading Antimicrobial-Resistant Bacteria: A Need for Quantitative Risk Assessment. Foodborne Pathog Dis. 2018;15(11):671–688. doi:10.1089/fpd.2018.2501

20-year vision of AMR and a 5-year (2019 to 2024): https://www.gov.uk/government/publications/uk-5-year-action-plan-for-antimicrobial-resistance-2019-to-2024

AMR National Action Plan (NAP): https://www.gov.uk/government/publications/uk-20-year-vision-for-antimicrobial-resistance

FS102127 - A systematic review of AMR bacteria in pork, poultry, dairy products, seafood and fresh produce at UK retail level: https://www.food.gov.uk/research/foodborne-diseases/a-systematic-review-of-amr-bacteria-in-pork-poultry-dairy-products-seafood-and-fresh-produce-at-uk-retail-level

FS102109 - EU Harmonised Survey of Antimicrobial Resistance (AMR) on retail meats (Pork and Beef/Chicken): https://www.food.gov.uk/research/foodborne-diseases/eu-harmonised-survey-of-antimicrobial-resistance-amr-on-retail-meats-pork-and-beefchicken-0

FS301050 - What is the burden of antimicrobial resistance genes in selected ready-to-eat foods?: https://www.food.gov.uk/research/foodborne-diseases/what-is-the-burden-of-antimicrobial-resistance-genes-in-selected-ready-to-eat-foods

FS301059 - A critical review of the impact of food processing on antimicrobial resistant (AMR) bacteria in meats and meat products: https://www.food.gov.uk/research/research-projects/a-critical-review-of-the-impact-of-food-processing-on-antimicrobial-resistant-amr-bacteria-in-meats-and-meat-products

Openness

FSA has values and specific policy on being open and transparent, which includes publishing the full dataset of its research and surveillance studies. Both the lead contractor and their sub-contractors must agree to this openness policy. Any potential issues with this should be highlighted within the proposals.

General Data Protection Regulation (GDPR)

Tenderers should also note that the EU's General Data Protection Regulation (GDPR) entered into force in the UK from the 25th of May 2018. Tenderers are therefore asked to consider what additional measures may need to be taken in order to comply with the new

regulatory regime for data protection, and to include in their proposals an explanation of how they intend to implement these measures.

In particular, the processor (the lead contractor) must:

● process the personal data only on the documented instructions of the Controller;

● comply with security obligations equivalent to those imposed on the Controller (implementing a level of security for the personal data appropriate to the risk);

● ensure that persons authorised to process the personal data have committed themselves to confidentiality or are under an appropriate statutory obligation of confidentiality;

● only appoint Sub-processors with the Controller's prior specific or general written authorisation, and impose the same minimum terms imposed on it on the Sub-processor; and the original Processor will remain liable to the Controller for the Sub-processor's compliance. The Sub-processor must provide sufficient guarantees to implement appropriate technical and organisational measures to demonstrate compliance. In the case of general written authorisation, Processors must inform Controllers of intended changes in their Sub-processor arrangements;

● make available to the Controller all information necessary to demonstrate compliance with the obligations laid down in Article 28 GDPR and allow for and contribute to audits, including inspections, conducted by the Controller or another auditor mandated by the Controller - and the Processor shall immediately inform the controller if, in its opinion, an instruction infringes GDPR or other EU or member state data protection provisions;

● assist the Controller in carrying out its obligations with regard to requests by data subjects to exercise their rights under chapter III of the GDPR, noting different rights may apply depending on the specific legal basis for the processing activity (and should be clarified by the Controller up-front);

● assist the Controller in ensuring compliance with the obligations to implementing a level of security for the personal data appropriate to the risk, taking into account the nature of processing and the information available to the Processor;

● assist the Controller in ensuring compliance with the obligations to carry out Data Protection Impact Assessments, taking into account the nature of processing and the information available to the Processor; and

● notify the Controller without undue delay after becoming aware of a personal data breach.

SCHEDULE 3

SPECIFIC OBLIGATIONS

1. SUPPLIER'S OBLIGATIONS

This Schedule 3 specifies the Ordered Services to be provided to the Client by the Supplier in the services required for FS307037.

LEAD APPLICANT'S DETAILS							
Surname	[redacted]	First Name	[redacted]	Initial	[redacted]	Title	[redacted]
Organisation	Ausvet Europe	Department					
Street Address	3 rue Camille Jordan						
Town/City	Lyon	Country	France	Postcode	69001		
Telephone No	[redacted]	E-mail Address	[redacted]				
Is your organisation is a **small and medium enterprise**. (EU recommendation 2003/361/EC refers http://www.hmrc.gov.uk/manuals/cirdmanual/cird92800.htm)	Yes	x	No				
TENDER SUMMARY							
TENDER TITLE							
Development of a modular assessment framework to quantify the risk of AMR exposure via food products: example of chicken and lettuce							
TENDER REFERENCE	**FS307037**						
PROPOSED START DATE	31/07/2020	**PROPOSED END DATE**	31/01/2022				
1: TENDER SUMMARY AND OBJECTIVES							
A. TENDER SUMMARY							
Our approach consists of developing a stochastic and modular modelling framework to quantify consumer's exposure to AMR bacteria that can be adapted to different microorganisms and antimicrobial resistant genes in different value chains. We will use the two UK production systems, chicken and lettuce value chains, as examples to develop the modelling framework. The modelling framework will be based on four modules including all critical production steps and intervention measures in the food chain (i.e. production, processing, post-processing and home-preparation). The model will be based on previous work but will be adapted to the specificities of UK industry through the inclusion of outputs from the literature review and inputs provided by relevant stakeholders of the UK industry. We will first develop and validate the model for the chicken value chain using the combination *E. coli* and *CMY-2* gene. The transferability of our model to other microorganisms will be tested using data from the second selected combination *Campylobacter jejuni* and *gyrA* for chicken. Subsequently, the original model developed for the chicken value chain will be adapted to the lettuce value chain using again the data from *E.*							

coli and *CMY-2* in this value chain. This last step will test the adaptability of the modelling framework and will help identifying the adjustments needed to ensure transferability to different value chains. Potential limitations and associated recommendations will be identified and discussed.

Finally, a user interface will be developed as an interactive web-based application that will allow users to select pre-defined risk questions and risk pathways of the food value chain. This interactive approach will allow users to explore the model outputs and to gain a good understanding of the quantitative risk assessment framework. The models and the user interface will be developed using R software and inputs from future users working at FSA.

B. OBJECTIVES AND RELEVANCE OF THE PROPOSED WORK TO THE FSA TENDER REQUIREMENT

OBJECTIVES

OBJECTIVE NUMBER	OBJECTIVE DESCRIPTION
1	IDENTIFICATION OF THE CRITICAL RISK PATHWAYS FOR EXPOSURE TO ARG THROUGH THE FOOD PRODUCTION CHAIN OF CHICKEN MEAT AND LETTUCE
2	DEVELOPMENT OF A MODULAR OFF THE SHELF QUANTITATIVE RISK ASSESSMENT MODEL FOR EXPOSURE TO ARG VIA CHICKEN MEAT
3	DEVELOPMENT OF A MODULAR OFF THE SHELF QUANTITATIVE RISK ASSESSMENT MODEL FOR EXPOSURE TO ARG VIA LETTUCE
4	DEVELOPMENT OF USER-FRIENDLY INTERFACE FOR THE IMPLEMENTATION OF QUANTITATIVE RISK ASSESSMENT MODELS
5	DEVELOPMENT OF TRAINING AND SUPPORT MATERIAL FOR FSA STAFF, INCLUDING OPTIONS FOR CUSTOMIZATION OF MODELS TO OTHER FOOD PRODUCTS
6	FULL TECHNICAL REPORT

2: DESCRIPTION OF APPROACH/SCOPE OF WORK

A. APPROACH/SCOPE OF WORK

Antimicrobial resistance (AMR) is a major global public health challenge. AMR refers to microorganisms that become resistant to antimicrobial substances, such as antibiotics to which they were previously sensitive. The overuse of antibiotics has led to a dramatic increase of resistant patterns within the bacteria community jeopardizing veterinary and human medicine.

The food chain is one important transmission routes of AMR bacteria to humans. Food contamination might occur during preharvest and/or postharvest stages, depending on the food type. For example, leafy greens might be contaminated with AMR bacteria at a pre-harvest stage through contaminated manure, soil or wildlife vectors and at post-harvest stage during food preparation. In the case of animal food products, meat has been identified as one of the main carriers of AMR bacteria. The contamination of meat might occur at the slaughterhouse in different processes through cross-contamination but also at consumer level due to inappropriate food handling.

Foodborne diseases are estimated to be responsible for 500,000 cases each year in the UK (Jones et al., 2017). The Foodborne Disease Strategy has been primarily focused on *Campylobacter spp* and *Listeria monocytogenes* to reduce the burden of disease in the country (FSA, 2011, 2015). One recent study identified *E. coli*, *Shigella spp*, *Salmonella enterica* and *Listeria monocytogenes* as the highest occurring AMR food-borne pathogens in the UK and chicken meat as the major meat carrier of AMR in the country (Yang et al., 2020). Importantly, a systematic review conducted in 2016 concluded that the data available on the AMR bacteria prevalence in food produced in the UK was limited (Willis et al., 2018).

We understand that AMR in food poses a health risk for UK consumers and that further research is needed to fill knowledge-gaps of this transmission pathway. The presence of antimicrobial resistant genes (ARGs) in food can amplify the burden of foodborne AMR in the UK population. Quantifying consumers' exposure to specific AMR bacteria and ARGs from chicken and lettuce can elucidate the relative importance of two different value chains on the AMR transmission.

Our approach consists of developing a stochastic and modular modelling framework to quantify consumer's exposure to AMR bacteria that can be adapted to different microorganisms and ARGs in different value

chains. We will use the two UK production systems, chicken and lettuce value chains, as examples to develop the modelling framework. The modelling framework will be based on four modules including all critical production steps and intervention measures in the food chain (i.e. production, processing, post-processing and home-preparation). The model will be based on previous work from Collineau et al (Collineau et al., 2020) which described a farm-to-fork quantitative microbial risk assessment model of foodborne AMR, along the chicken production chain, to quantify the consumers' exposure to Salmonella Heidelberg resistant to third-generation cephalosporins. The model developed by Collineau et al.will be adapted to the specificities of UK industry through the inclusion of outputs from the literature review and inputs provided by relevant stakeholders of the UK industry. We will organise a survey targeting relevant stakeholders of the poultry and lettuce industry in the UK and then an elicitation workshop. Representatives from the UK industry will be consulted to define the risk pathways of the models and to discuss the effectiveness of intervention measures influencing AMR and ARG in bacteria contamination in the food chain.

We have selected two combinations of microorganisms and ARGs (defined as AMR1 and AMR2 in this project) to test and validate the models. The first combination (AMR1) is represented by the microorganism *E. coli* and the ampC beta-lactamase gene *CMY-2*. This case study will be tested for both chicken and lettuce. The second combination (AMR2) is represented by *Campylobacter jejuni* and the mutated *gyrA* gene. AMR2 will be tested only for chicken.

Reasons for these choices include:

(1) **Public health relevance of *E. coli* in chicken and lettuce:** *E. coli* is one of the main responsible microorganisms of intestinal and extraintestinal diseases in both humans and animals. The importance of *E. coli* in public health has led to a considerable amount of data available in the literature on both chicken meat and leafy greens compared to other microorganisms (Deng et al., 2015; Heider et al., 2009). The amount of data available on *E. coli* is also due to the use of *E. coli* as an indicator for microbial contamination in food and as AMR indicator in food producing animals (ECDC et al., 2017).

(2) **Public health relevance of the gene CMY-2 in *E. coli***: The *CMY-2* gene is the most common and widely disseminated AmpC β-lactamase documented in human and animal bacteria (Deng et al., 2015; Koga et al., 2019). *CMY-2* encodes resistance to β-lactams antibiotics, including cephalosporins and Cephalosporin-resistant *Enterobacteriaceae* are in the critical priority pathogen list of the WHO (WHO, 2017). The importance of the gene CMY-2 in *E.coli* is reflected by the large amount of information available in the literature for both meat and contaminated leafy greens (O'Flaherty et al., 2019). As an example, data on AmpC producing *E. coli* are regularly collected at the slaughter house and retail levels as part of the compulsory monitoring program of the UK (EC, 2017). A systematic review conducted in 2016 showed that *E.coli* was detected in 49% of the chicken samples with a phenotypic AmpC profile in 11.5% (39/339) of the isolates. Latest results from the UK-regular monitoring program have shown a prevalence of AmpC-producing *E.coli* in broiler meat of 6.1% with a decreasing trend of 70% from 2016 to 2018 (EFSA, 2020).
It should be noted that the *CMY-2* gene is generally located in a plasmid, which facilitates its transferability to other bacteria through horizontal gene transfer (Deng et al., 2015). However, we will not consider the location of *CMY-2* gene in a plasmid to simplify the model.

(3) **Public health relevance of *Campylobacter spp* in chicken:** *Campylobacter spp* is one of the most prevalent food-borne pathogens in the UK (FSA, 2011, 2015). As an example, *Campylobacter jejuni* was detected in 87.7% of the chicken samples with skin at retail in one study in the UK (Jorgensen et al., 2017).

(4) **Public health relevance of the mutated gyrA gene in *Campylobacter spp***: the mutated *gyrA* gene encodes resistance to fluoroquinolones, and fluoroquinolone-resistant *Campylobacter spp*. is on the high priority list of the WHO (Sproston et al., 2018; WHO, 2017; Jesse et al., 2006). The gene is generally located in the chromosome and the presence of a point mutation has been identified as the main responsible for fluoroquinolone resistance in *Campylobacter spp* (EFSA, 2020; Jesse et al., 2006). Fluoroquinolone-resistant campylobacter has been detected worldwide in chicken faecal samples and in retail chicken meat (Smith & Fratamico, 2010). The presence of fluoroquinolone resistant *Campylobacter jejuni* in chicken meat has shown an increase in the last few years in the UK from 21% in 2007-2008 to 49% in 2014-2015 (Sproston et al., 2018).

We will first develop and validate the model for the chicken value chain using the combination AMR1 (*E. coli* and *CMY-2* gene). The transferability of our model to other microorganisms will be tested using data from the second selected combination AMR2 (*Campylobacter jejuni* and *gyrA*) for chicken. Subsequently, the original model developed for the chicken value chain will be adapted to the lettuce value chain using again the data from *E. coli* and *CMY-2* (AMR1) in this value chain. This last step will test the adaptability of the modelling framework and will help identifying the adjustments needed to ensure transferability to different value chains.

Finally, a user interface will be developed as an interactive web-based application that will allow users to select pre-defined risk questions and risk pathways of the food value chain. This interactive approach will allow users to explore the model outputs and to gain a good understanding of the quantitative risk assessment framework. The models and the user interface will be developed using R software.

As part of the external quality assurance, an international advisory board, with expertise on quantitative food safety risk assessment, AMR and the UK value chains of chicken and lettuce, will assist the project team throughout the project. The advisory board will help for example, in understanding the UK industry, providing advice on technical requirements for quantitative risk assessment and, identifying critical hurdles of the model under real conditions.

Inputs data for the model will include quantitative information on prevalence of selected bacteria and of ARGs (defined as AMR1 and AMR2) gathered through existing literature and assessed by meta-analysis. Conducting meta-analysis will help to understand the potential for bias of selected studies during the literature review and to better interpret the quality of the results. Quantitative information on ARGs will be mainly sourced through quantitative polymerase chain reaction (qPCR) results. However, results from qPCR do not allow to know the presence of viable bacteria carrying *CMY-2* gene or *gyrA* gene. Similarly, results from the UK monitoring programs on AMR will be used as a source of information for the model but these programs are also mainly based on phenotypic resistance data. The lack of genotypic data available is a critical challenge in the project. If inadequate data is available, we will make assumptions based on correlations between phenotypic and genotypic resistance taking into account the fact that, in most of the cases, changes in phenotypic resistance of bacteria is driven by a genetic change, which might involve the acquisition of ARG. However, the presence of ARGs in the bacteria genome are not always associated with phenotypic resistance. These assumptions might thus result in increased uncertainty in model outputs. To highlight the impact of stochasticity and uncertainty in the input parameters on model results, we will perform a sensitivity analysis.

To ensure that the project meets FSA's needs, we will foster a collaborative working approach with FSA and remain ready to adapt to emerging needs during the project development. To support this close collaboration, we will provide regular updates about the tasks being undertaken and project progress, and incorporate FSA's recommendations and feedback (if any) into the planning of upcoming tasks. For example, FSA's input will be particularly important during the testing of the user-interface for the model. Another example is ensuring common agreement with FSA regarding key parameters of the risk assessment models.

References:

Collineau, L., Chapman, B., Bao, X., Sivapathasundaram, B., Carson, C. A., Fazil, A., Reid-Smith, R. J., & Smith, B. A. (2020). A farm-to-fork quantitative risk assessment model for Salmonella Heidelberg resistant to third-generation cephalosporins in broiler chickens in Canada. *International Journal of Food Microbiology*, 108559. https://doi.org/10.1016/j.ijfoodmicro.2020.108559

Deng, H., Si, H. Bin, Zeng, S. Y., Sun, J., Fang, L. X., Yang, R. S., Liu, Y. H., & Liao, X. P. (2015). Prevalence of extended-spectrum cephalosporin-resistant Escherichia coli in a farrowing farm: ST1121 clone harboring IncHI2 plasmid contributes to the dissemination of blaCMY-2. *Frontiers in Microbiology*, *6*(NOV), 1–8. https://doi.org/10.3389/fmicb.2015.01210

EC. (2017). *Final report of an audit carried out in the United Kingdom from 21 March 2017 to 31 March 2017 in order to evaluate the monitoring and reporting of antimicrobial resistant in zoonotic and commensal bacteria in certain food-producing animal populations and*.

ECDC, EFSA, & EMA. (2017). ECDC, EFSA and EMA Joint Scientific Opinion on a list of outcome indicators as regards surveillance of antimicrobial resistance and antimicrobial consumption in humans and food-producing animals. In *EFSA Journal* (Vol. 15, Issue 10). https://doi.org/10.2903/j.efsa.2017.5017

EFSA. (2020). The European Union Summary Report on antimicrobial resistance in zoonotic and indicator bacteria from humans, animals and food in 2010. *EFSA Journal*. https://doi.org/10.2903/j.efsa.2012.2598

FSA. (2011). Foodborne Disease Strategy 2010-2015. In *FSA* (Issue May).

FSA. (2015). Food Standards Agency Strategic Plan 2015-20. In *FSA*. https://www.food.gov.uk/sites/default/files/FSA strategy document 2015-2020_April 2015_interactive %282%29.pdf

FSA. (2016). *CSA Science Report - Antimicrobial resistance in the food supply chain* (Issue September). https://doi.org/Report no: S/97/002

Heider, L., Hoet, A., Wittum, T., Khaitsa, M., Love, B., Huston, C., Morley, P., Funk, J., & Gebreyes, W. (2009). Genetic and Phenotypic Characterization of the bla CMY Gene from Escherichia coli and Salmonella enterica. *Foodborne Pathogens and Disease*, *6*(10).

Holvoet, K., Sampers, I., Callens, B., Dewulf, J., & Uyttendaele, M. (2013). Moderate prevalence of antimicrobial resistance in escherichia coli isolates from lettuce, irrigation water, and soil. *Applied and Environmental Microbiology*, *79*(21), 6677–6683. https://doi.org/10.1128/AEM.01995-13

Hölzel, C. S., Tetens, J. L., & Schwaiger, K. (2018). Unraveling the role of vegetables in spreading antimicrobial-resistant bacteria: A need for quantitative risk assessment. *Foodborne Pathogens and Disease*, *15*(11), 671–688. https://doi.org/10.1089/fpd.2018.2501

Jesse, T. W., Englen, M. D., Pittenger-Alley, L. G., & Fedorka-Cray, P. J. (2006). Two distinct mutations in

gyrA lead to ciprofloxacin and nalidixic acid resistance in Campylobacter coli and Campylobacter jejuni isolated from chickens and beef cattle. *Journal of Applied Microbiology*, *100*(4), 682–688. https://doi.org/10.1111/j.1365-2672.2005.02796.x

Jones, A. K., Cross, P., Burton, M., Millman, C., O'Brien, S. J., & Rigby, D. (2017). Estimating the prevalence of food risk increasing behaviours in UK kitchens. *PLoS ONE*, *12*(6), 1–17. https://doi.org/10.1371/journal.pone.0175816

Jorgensen, F., Madden, R., Swift, C., Arnold, E., Charlett, A., & Elviss, N. (2017). *FSA Project FS102121. Antimicrobial resistance in Campylobacter jejuni and Campylobacter coli from retail chilled in the UK.* https://www.food.gov.uk/print/pdf/node/1571

Koga, V. L., Maluta, R. P., Silveira, W. D., Ribeiro, R. A., Hungria, M., Vespero, E. C., Nakazato, G., & Kobayashi, R. K. T. (2019). *Characterization of CMY-2-type beta- lactamase-producing Escherichia coli isolated from chicken carcasses and human infection in a city of South Brazil*. 1–9.

O'Flaherty, E., Solimini, A. G., Pantanella, F., De Giusti, M., & Cummins, E. (2019). Human exposure to antibiotic resistant-Escherichia coli through irrigated lettuce. *Environment International*, *122*(November 2018), 270–280. https://doi.org/10.1016/j.envint.2018.11.022

Smith, J. L., & Fratamico, P. M. (2010). Fluoroquinolone Resistance in Campylobacter. *Journal of Food Protection*, *73*(6), 1141–1152.

Sproston, E. L., Wimalarathna, H. M. L., & Sheppard, S. K. (2018). Trends in fluoroquinolone resistance in campylobacter. *Microbial Genomics*, *4*(8). https://doi.org/10.1099/mgen.0.000198

WHO. (2017). *Global priority list of antibiotic-resistant bacteria to guide research, discovery, and development of new antibiotics*. https://www.who.int/news-room/detail/27-02-2017-who-publishes-list-of-bacteria-for-which-new-antibiotics-are-urgently-needed

Willis, C., Jorgensen, F., Elviss, N., Cawthraw, S., Randall, L., Ellington, M., Hopkins, K., Swift, C., & Woodford, N. (2018). *FSA Project FS101196 Surveillance Study of Antimicrobial Resistance in Bacteria Isolated from Chicken and Pork Sampled on Retail Sale in the United Kingdom .*

Yang, K., Wang, A., Fu, M., Wang, A., Chen, K., Jia, Q., & Huang, Z. (2020). Investigation of incidents and trends of antimicrobial resistance in foodborne pathogens in eight countries from historical sample data. *International Journal of Environmental Research and Public Health*, *17*(2), 6–8. https://doi.org/10.3390/ijerph17020472

B. INNOVATION

The project team will propose a modelling framework to quantitatively assess the probability of exposure to ARGs via chicken meat and lettuce. The three key innovative parts of our approach are:

- Development of a model based on real-world processes used by UK industry, and on UK-specific ARG data. This will be achieved by defining the ARG risk pathways based on inputs provided by key UK industry representatives at the very beginning of the project and by using UK-specific input data wherever it is possible.
- Development of a flexible modelling framework allowing the model users to easily select their own risk question and pathway to follow for the risk assessment. The model users will be able to select the chain of food processes they would like to combine and for which they want to estimate the risk of ARG exposure.
- Development of an evolutive modelling framework allowing the users to estimate the risk of AMR exposure for multiple ARGs. The model will be developed and tested for two ARGs of interest, but the end user will have the possibility to update input data as soon as new scientific evidence will become available. In addition, the end user will be able to upload parameters related to other ARGs of interest.

3: THE PROJECT PLAN AND DELIVERABLES

A. THE PLAN

The project will be divided in 6 main tasks, which are summarized in figure 1. In the rest of the text AMR 1 and AMR 2 refer to the microorganisms and resistance genes selected and presented in the section A "approach/scope of the work". AMR 1 refers to the microorganism *E. coli* and the ampC beta-lactamase gene *CMY-2,* and AMR2 refers to the microorganism *Campylobacter spp* and the mutated *GyrA gene*.

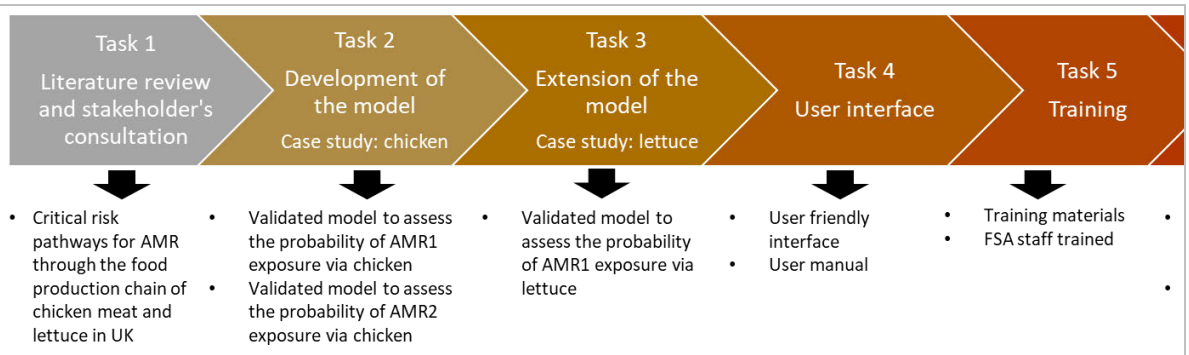


Figure 1: Project plan and deliverables

TASK 1 – EVIDENCE GATHERING THROUGH LITERATURE REVIEW AND INTERACTION WITH UK POULTRY AND LETTUCE INDUSTRY REPRESENTATIVES

1.1. LITERATURE REVIEWS

The team will conduct two literature reviews to help a) defining the risk pathways from farm / field to consumer via a supermarket/market route and identifying relevant parameters of the risk assessment models and b) gathering quantitative information on prevalence of bacteria along the food chain and of genes for antimicrobial resistance considering combinations AMR 1 and AMR 2. The literature reviews will be focused on UK data and value chains. However, other non-UK references will be considered in case of relevant data gaps. For example, the number of studies about the role of leafy greens on AMR transmission is limited compared to animal food products (Holvoet et al., 2013). Even if several studies from outside the UK have shown evidence of phenotypic resistance AMR bacteria present in fresh vegetables (Hölzel et al., 2018; O'Flaherty et al., 2019), there is a lack of AMR data available on fresh produce in the UK (FSA, 2016).

The first literature review and meta-analysis will review existing quantitative risk assessment models for antimicrobial resistance along the food chain and other relevant references on prevalence of antimicrobial resistance genes. The review will focus on two main aspects. First, focus will be placed on the parameters that are used to model the influence of production and processing steps on the abundance of bacteria in animal and food. Second, focus will be placed on the inclusion of prevalence data on antimicrobial resistance genes, as opposed to phenotypic information, in quantitative risk assessment models. This literature review will be conducted using PubMed and Google Scholar. Preference will be given to publications on the poultry and lettuce value chains, but quantitative risk assessment models for other food value chains will also be reviewed when deemed relevant.

A second literature review and meta-analysis will be conducted to collect and subsequently analyse existing quantitative information on combinations AMR 1 and AMR 2. For this literature review both peer reviewed publications (via PubMed, Google Scholar) as well grey literature (from Conference papers index, Government repositories and other sources) will be considered.

1.2. RISK MANAGEMENT PRACTICES SURVEY, ELICITATION WORKSHOP WITH UK INDUSTRY AND FSA MEETING

The organization of the risk management survey and of the elicitation workshop will be initially discussed with FSA and the way forward agreed.

The survey will be organized, with the collaboration of FSA and UK members of the advisory board through their contact networks, targeting a representative sample of poultry and lettuce industry actors and other relevant stakeholders in the UK to access and discuss perceived strengths and weaknesses of the current intervention measures along the value chains for reduction of bacterial contamination in general and combinations AMR 1 and AMR 2 specifically, as well as for reducing AMR in the food chain that are currently in place. Preliminary results from the literature reviews and of the survey will be presented and discussed with representatives of the UK industry in an ad-hoc remote elicitation workshop. The workshop will take place through a web-based format. Participants will receive the results of the survey and of the literature review in advance, with questions to be addressed during the workshop. During the workshop the importance of confidentiality will be reiterated to support a frank discussion about the effectiveness of risk management measures in the context of bacterial contamination and AMR. At this occasion, the preliminary structure of the risk assessment model (production and processing steps and relevant parameters) will be presented and agreed.

A meeting with FSA will be held to present the results of the literature review, of the workshop output and agree on the selection of bacteria, AMR genes and other model parameters. Outputs from this meeting will be taken into consideration for the development of the models.

TASK 2 – DEVELOPMENT OF THE MODELLING FRAMEWORK – AMR EXPOSURE VIA CHICKEN MEAT

In this part of the work, the team will develop a first draft of stochastic modelling framework using as a case study chicken meat contaminated with AMR 1 and AMR 2.

2.1 MODEL BUILDING

The modelling framework will be based on (Collineau et al. 2020) and will be made of 4 modules each representing different key intermediary steps in the food chain. The *Production module* will include all the key on-farm practices having an influence on the probability of bacteria and AMR genes prevalence in food. The *Processing module* will include all the food transformation process from raw product (e.g., slaughterhouse for animal products) to manufactured product including packaging and their associated probabilities of reducing bacteria and AMR genes contamination in food. The *Post-processing module* will focus on transport and storage practices having an influence on bacteria and AMR genes contamination level. Finally, the *Home preparation module* will include the key consumers behaviour (e.g. washing lettuce or meat cooking) having an influence on the final AMR exposure which is a function of the prevalence and level of contamination of food units at the time of consumption. Input parameters will be represented by probability distributions in order to account for both variability and uncertainty in the parameter estimate. Predictive microbiology, through off the shelf free software (e.g., ComBase or Baseline or similar), will allow to define the effect of varying management practices and parameters in the prediction of growth and inactivation of selected bacteria.

The model developed by (Collineau et al. 2020) will be adapted to the specific needs of this project. In particular, the food processing options included in the model will be defined based on real-world processes used by UK industry (see Task 1). Similarly, UK and AMR 1-specific data will be used to populate the model where possible. In addition, the model will be modified in order to allow the end-users to select their own risk question and pathway. For example, different type of slaughter will be able to be combined with different type of meat processing depending on the user needs. Using as example the simplified event tree presented in figure 2, the end user might choose to estimate the probability of AMR exposure via slaughter of type A and meat processing approach 1 (probability equal to pA*p1 + (1-pA)*p1) or the probability of AMR exposure via slaughter of type A and meat processing approach 2 (probability equal to pA*p2 + (1-pA)*p2 with p2 equals to the probability of meat being contaminated after meat processing approach 2).

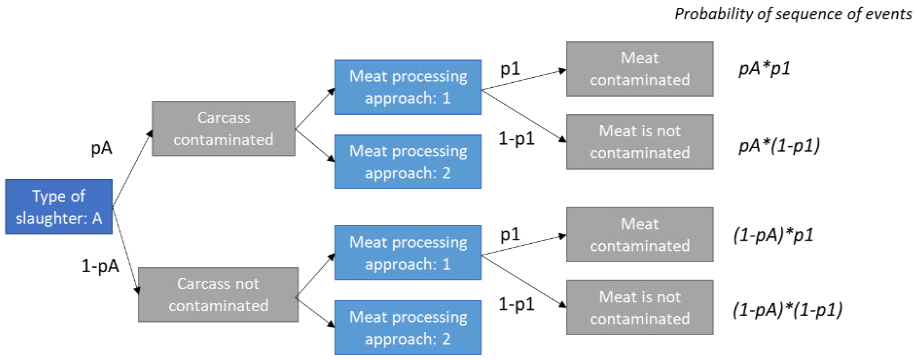


Figure 2: Probabilities of AMR exposure associated with the module "Processing" using a simplified example related to chicken meat. Blue boxes represent meat processing options. (only 2 are shown as an examples). Grey boxes represent the associated probabilities of meat contamination. pA = probability of carcass being contaminated after slaughter of type A, p1 = probability of meat being contaminated after meat processing approach 1.

2.2 EXPOSURE ASSESSMENT

The Monte Carlo simulation model will be constructed in R as the software allows complex model building and is easily combinable with flexible and interactive user interfaces (see details in task 4). 10,000 iterations will be run by randomly sampling each of the probability distribution previously defined in order to estimate the AMR exposure risk at each step of the production chain.

At the end of each module the following probabilities will be estimated:

- *Production module* = proportion and level of contaminated food unit at the end of the production system
- *Processing module* = level of contaminated food unit at the end of the processing and manufacturing plan
- *Post-processing module* = level of contaminated food unit at the moment of sale
- *Home preparation module* = exposure to AMR genes and bacteria of consumers

A sensitivity analysis will be performed in order to estimate the impact of stochasticity and uncertainty in the input parameters on model results. The correlation between the values of the input parameters and the probabilities of exposure will be calculated using Spearman's rank correlation coefficients.

2.3 MODEL VALIDATION

The model will be validated first by comparing the results obtained for one selected chicken meat processing chain with existing scientific literature about AMR 1. The project team will also test the ability of the developed modelling framework to be adapted to other pathogen and/or gene of interest. The model inputs will be modified to include data related to AMR 2 resistance and/or transmission. The model will be validated by comparing model outputs with the existing scientific literature for this new pathogen/gene of interest.

TASK 3 – EXTENSION OF THE MODELLING FRAMEWORK – AMR EXPOSURE VIA LETTUCE

The team will adapt the modelling framework developed in task 2 to the case of lettuce production using AMR 1 as a case study. Using the same pathogen for lettuce and chicken meat will allow us to compare the probabilities of AMR 1 consumers exposure via two different sources.

3.1 MODEL BUILDING

The 4 key modules previously described will be re-used as a basis for building the model. Some food-processing options will remain the same between the two production chains (i.e., chicken and lettuce). For example, the type of production (organic vs standard) will remain a key factor to be filed for assessing the risk of AMR exposure via the two food products. However, specific food processing options required for lettuce will be added. As example, in the *Production module*, the different type of irrigation water, soil and organic fertilizer used will be included as they can be a source of AMR contamination. Lettuce processing options will be defined based on the real-world processes used by UK industry (see Task 1). Similarly, UK, AMR 1, and lettuce -specific data will be used to populate the new lettuce model where possible

It is expected that quantitative data will be missing for properly assessing the risk of AMR exposure via lettuce consumption (Hölzel, Tetens, and Schwaiger 2018). To address the issue of missing data, the team will develop a short guideline to help identifying the best possible input parameters based on the existing scientific knowledge. For example, if no data is available for AMR 1 in lettuce in UK, the guideline would recommend using AMR 1 data for lettuce in other country. If such data still not exist, it will be recommended to use AMR 1 data available for another food product close to lettuce in UK, and so on. If no data is available at all, the guideline might for example recommend implementing expert elicitation to estimate model inputs parameters.

3.2 MODEL VALIDATION

The model will be validated by comparing model outputs with the existing scientific literature and with the results previously obtained in chicken. This part of the work will be also used to assess and discuss the feasibility to extend the modelling framework to other food production chains. Potential limitations and associated recommendations will be highlighted.

TASK 4 – DEVELOPMENT OF USER INTERFACE

The team will develop a web-based application with graphical user interface (GUI) that allows users, in particular risk managers, to select their own risk question and pathway to follow, and to explore the model outputs such as the calculations behind the quantitative risk assessment. Our aim is to produce an application that clearly illustrates the results and communicates the information without biasing the user's opinion.

4.1 CONTENT OF THE GUI

Because the model developed in Tasks 2 and 3 has the capacity to produce results for multiple pathogens and routes of exposure, the application will be developed to allow the user to select step-by-step the microorganism, gene, and/or route of exposure of interest. In addition, the input parameters for AMR 1 and AMR 2 will be made readily available, but the users will be allowed to upload new parameters related to new microorganism and gene of interest. The model inputs and outputs will be presented based on recommendations from (Cook et al. 2019) (see one example of possible GUI in Fig 3). Regarding the model outputs, the probabilities of AMR exposure associated with each module, or each stage of the production chain, will be presented together with the overall probability of AMR exposure at the end of the food production chain. Results of the sensitivity analysis will be also provided in order to clearly display the impact of stochasticity and uncertainty in the input parameters on model results. Explanations on how to interpret the model outputs will be added to the GUI.

The GUI will be developed using shiny, a R package allowing for the development of a fully interactive and user-friendly web-based dashboard. The GUI will aim at being as much as possible self-explanatory. However, a user manual will be developed to summarize the main features of the GUI. The user manual will also contain additional information on how to implement advanced features such as for example the upload of new input parameters related to new pathogen and/or gene of interest, and how to deal with missing data.

4.2 TEST OF THE GUI

To ensure that the GUI meets its objective of being accessible and understandable without requiring the user to have detailed technical computing knowledge to use it, a draft of GUI will be submitted to the future FSA users. The GUI will be then adapted according to the recommendations provided by the future users.

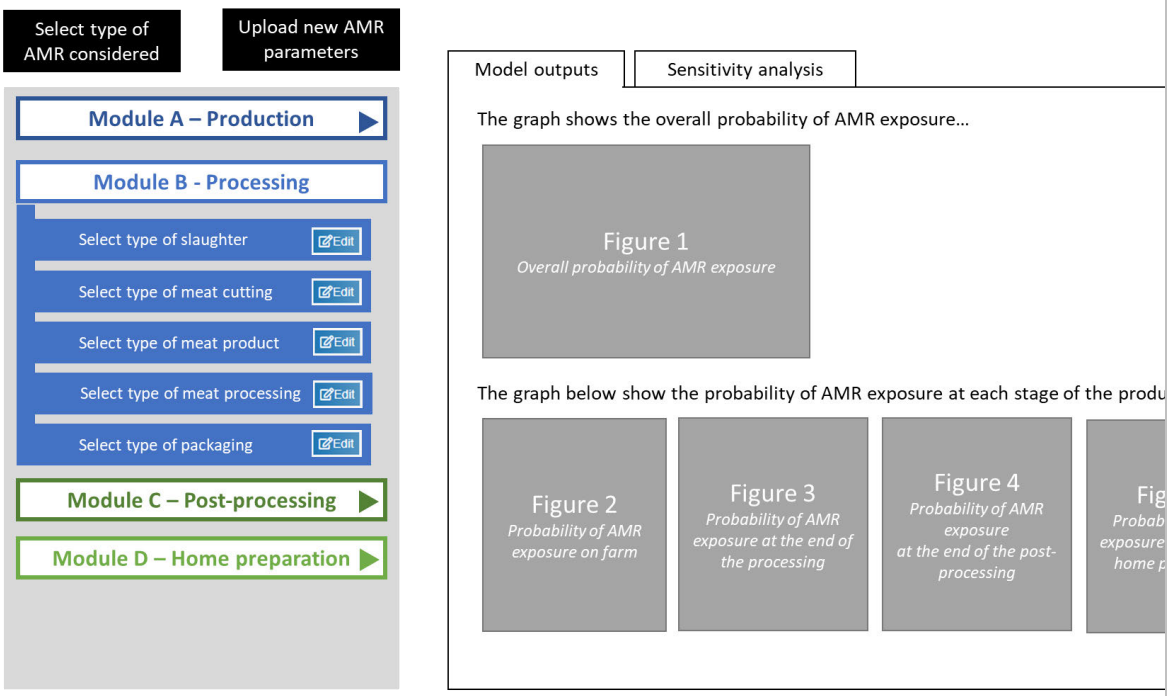


Figure 3: Example of interactive user interface

TASK 5 TRAINING AND DISSEMINATION

The project will implement training and dissemination activities both tailored to specific client needs and to the interest of the wider scientific community.

5.1 CLIENT-ORIENTED TRAINING

The user's manual developed in Task 4 will be accompanied by a training curriculum and training materials, e.g. PowerPoint presentations and a training dataset based on AMR 1 and AMR 2. Subsequently, a training course will be organized for selected staff of the client to familiarize them with the quantitative risk assessment modules, to demonstrate how the modules can be run and adjusted.

5.2 DISSEMINATION FOR THE WIDER SCIENTIFIC AND STAKEHOLDERS COMMUNITY

The project will aim to deliver one manuscript (topic to be defined as we go) for submission to international peer-reviewed journal. In addition, the outputs of the project will be also presented to a more general audience at the end of the project. The closing meeting will involve FSA staff, decision makers and key UK industry representatives.

TASK 6: REPORTING

A full technical description of the modelling framework developed for chicken and lettuce will be produced. This report will provide a full technical description of the models such as a list of input parameters for AMR 1, and AMR 2 and their associated references. Based on the outputs of task 2 and 3, the technical report will also discuss the ability of the developed framework to easily include new pathogen and/or new gene of interest. Potential limitations and associated recommendations will be highlighted.

REFERENCES

Collineau, L., Chapman, B., Bao, X., Sivapathasundaram, B., Carson, C. A., Fazil, A., Reid-Smith, R. J., & Smith, B. A. (2020). A farm-to-fork quantitative risk assessment model for Salmonella Heidelberg resistant to third-generation cephalosporins in broiler chickens in Canada. *International Journal of Food Microbiology*, 108559. https://doi.org/10.1016/j.ijfoodmicro.2020.108559

Cook, Charlotte J, Robin RL Simons, Verity Horigan, Amie Adkin, Giuseppe Ru, and Marco de Nardi. 2019. "Communicating Outputs from Risk Assessment Models: A Picture Paints a Thousand Words." Microbial Risk Analysis, SPatial Assessments of Risk for Europe -- Evaluating the incursion and spread of exotic animal disease through Europe, 13 (December). https://doi.org/10.1016/j.mran.2019.07.005.

FSA. (2016). *CSA Science Report - Antimicrobial resistance in the food supply chain* (Issue September). https://doi.org/Report no: S/97/002

Holvoet, K., Sampers, I., Callens, B., Dewulf, J., & Uyttendaele, M. (2013). Moderate prevalence of antimicrobial resistance in escherichia coli isolates from lettuce, irrigation water, and soil. *Applied and Environmental Microbiology*, *79*(21), 6677–6683. https://doi.org/10.1128/AEM.01995-13

Hölzel, C. S., Tetens, J. L., & Schwaiger, K. (2018). Unraveling the role of vegetables in spreading antimicrobial-resistant bacteria: A need for quantitative risk assessment. *Foodborne Pathogens and Disease*, *15*(11), 671–688. https://doi.org/10.1089/fpd.2018.2501

O'Flaherty, E., Solimini, A. G., Pantanella, F., De Giusti, M., & Cummins, E. (2019). Human exposure to antibiotic resistant-Escherichia coli through irrigated lettuce. *Environment International*, *122*(November 2018), 270–280. https://doi.org/10.1016/j.envint.2018.11.022

B. DELIVERABLES

DELIVERABLE NUMBER OR MILESTONE IN ORDER OF EXPECTED ACHIEVEMENT	TARGET DATE	TITLE OF DELIVERABLE OR MILESTONE
M1 (MILESTONE FOR OBJECTIVE 1)	31/07/2020	KICK-OFF MEETING
M2 (MILESTONE FOR OBJECTIVE 1)	01/10/2020	WORKSHOP WITH UK INDUSTRY
D1 (DELIVERABLE FOR OBJECTIVE 1)	**15/10/2020**	**REPORT CRITICAL RISK PATHWAYS FOR AMR THROUGH THE FOOD PRODUCTION CHAIN OF CHICKEN MEAT AND LETTUCE IN UK**
M3 (MILESTONE FOR OBJECTIVE 1)	01/11/2020	MEETING WITH FSA TO AGREE ON RISK PATHWAYS TO BE CONSIDERED
M4 – (MILESTONE FOR OBJECTIVE 1)	01/02/2020	MODEL ASSESSING THE PROBABILITY OF AMR 1 EXPOSURE VIA CHICKEN MEAT CREATED
M5 (MILESTONE FOR OBJECTIVES 2)	01/03/2021	MODEL ASSESSING THE PROBABILITY OF AMR 1 EXPOSURE VIA CHICKEN MEAT AUDITED AND VALIDATED BY AN INDEPENDANT EPIDEMIOLOGIST
M6 (MILESTONE FOR OBJECTIVES 2)	10/03/2021	MODEL ASSESSING THE PROBABILITY OF AMR 2 EXPOSURE VIA CHICKEN MEAT CREATED
M7 (MILESTONE FOR OBJECTIVE 2)	20/03/2021	MODEL ASSESSING THE PROBABILITY OF AMR 2 EXPOSURE VIA CHICKEN MEAT AUDITED AND VALIDATED BY AN INDEPENDANT EPIDEMIOLOGIST
M8 (MILESTONE FOR OBJECTIVE 2)	06/10/2021	DOCUMENTATION OF THE MODEL CHANGES BETWEEN AMR1 AND AMR2
D4 (DELIVERABLE FOR OBJECTIVE 2)	**01/04/2021**	**INTERIM TECHNICAL REPORT: CHICKEN MODEL THIS REPORT WILL INCLUDE INFORMATION ON • RISK PATHWAYS • MODEL STRUCTURE • INPUT DATA NEEDED • INTERPRETATION OF RESULTS • DOCUMENTATION OF MODEL CHANGE FROM AMR1 TO AMR2**
M9 (MILESTONE FOR OBJECTIVE 3)	01/06/2021	MODEL ASSESSING THE PROBABILITY OF AMR 1 EXPOSURE VIA LETTUCE CREATED
M10 - (MILESTONE FOR OBJECTIVE 3)	15/06/2021	MODEL ASSESSING THE PROBABILITY OF AMR 1 EXPOSURE VIA LETTUCE AUDITED AND VALIDATED BY AN INDEPENDANT EPIDEMIOLOGIST
M11 - (MILESTONE FOR OBJECTIVES 3)	20/03/2021	DOCUMENTATION OF THE MODEL CHANGES BETWEEN AMR1 (CHICKEN) AND AMR1 (LETTUCE)
D3 (DELIVERABLE FOR OBJECTIVE 3)	**01/07/2021**	**INTERIM TECHNICAL REPORT: LETTUCE MODEL THIS REPORT WILL INCLUDE INFORMATION ON • RISK PATHWAYS • MODEL STRUCTURE • INPUT DATA NEEDED • INTERPRETATION OF RESULTS • DOCUMENTATION OF MODEL CHANGE FROM CHICKEN MODEL TO LETTUCE MODEL**

M12 - (MILESTONE FOR OBJECTIVE 4)	15/09/2021	DRAFT USER-FRIENDLY INTERFACE SUBMITTED TO FSA
M13 - (MILESTONE FOR OBJECTIVE 4)	06/10/2021	COMMENTS RECEIVED FROM FSA ABOUT DRAFT OF USER INTERFACE
D4 - (DELIVERABLE FOR OBJECTIVE 4)	01/11/2021	FINAL VERSION OF THE USER INTERFACE
M14 - (MILESTONE FOR OBJECTIVE 5)	15/11/2021	TRAINING SESSION FOR STAFF AT THE FSA IMPLEMENTED
D5 - (DELIVERABLE FOR OBJECTIVE 5)	**01/12/2021**	**FINAL VERSION OF USER MANUAL**
M15 - (MILESTONE FOR OBJECTIVE 6)	01/12/2021	FIRST DRAFT FINAL TECHNICAL REPORT SUBMITTED TO FSA
M16 - (MILESTONE FOR OBJECTIVE 6)	01/11/2022	COMMENTS RECEIVED FROM FSA ABOUT THE FIRST DRAFT FINAL TECHNICAL REPORT
D6 (DELIVERABLE FOR OBJECTIVE 6)	**31/01/2022**	**FINAL TECHNICAL REPORT** **THIS REPORT WILL INCLUDE:** **• INFORMATION FROM THE TWO PREVIOUS INTERIM TECHNICAL REPORTS (D2 AND D3)** **• EXPLICIT DOCUMENTATION FOR THE CHANGES THAT WERE MADE TO CONVERT AMR1 (CHICKEN) TO AMR2 (CHICKEN), AND AMR1 (CHICKEN) TO AMR1 (LETTUCE),** **• DISCUSSION RELATED TO THE FACILITY OF THE DEVELOPED FRAMEWORK TO INCLUDE NEW PATHOGEN AND/OR NEW GENE OF INTEREST, POTENTIAL LIMITATIONS AND ASSOCIATED RECOMMENDATIONS.**

4: ORGANISATIONAL EXPERIENCE, EXPERTISE and STAFF EFFORT

A. PARTICIPATING ORGANISATIONS' PAST PERFORMANCE

1) Fleming Fund Country Grant, Indonesia (https://www.flemingfund.org/countries/indonesia/)
Start date: December 2019
End date: September 2022
Client: UK Department of Health and Community Services
Partners:

- DAI (project coordination),
- Health Security Partners (Laboratory strengthening),
- Eijkman Institute (Laboratory strengthening)
- Liverpool School of Tropical Medicine (laboratory biosecurity)

Value: £8 million
Description: Ausvet is currently contracted to lead the AMR surveillance package of the Fleming Fund Indonesia Country grant. Working as part of an international consortium, Ausvet is supporting the Government of Indonesia to develop and strengthen capacity for One Health surveillance of antimicrobial use and antimicrobial resistance in human health, livestock production and aquaculture.
Relevance: Results from the projects will strengthen capacity for AMR surveillance and control in Indonesia and will provide scientific evidence to inform decision makers, and other relevant stakeholders about AMR
Skills: AMU and AMR surveillance systems development, training on AMR assessment

2) EU-FORA Risk Assessment Fellowship program 2019-2021
(https://www.efsa.europa.eu/it/engage/fellowship)
Start date: August 2019
End date: July 2021
Client: EFSA
Partners:

- Austrian Agency for Health and Food Safety (AGES) (Project Coordinator)
- SAFOSO (Switzerland)
- German Federal Institute for Risk Assessment (BfR)
- Greek National Food Authority (EFET)

Value: 750.000 Euros
Description: The European Food Risk Assessment (EU-FORA) Fellowship Programme is a key initiative for building the EU's scientific assessment capacity and knowledge community. EU-FORA offers to mid-career scientists from EU and EFTA countries training modules to widen their knowledge and hands-on experience in food safety risk assessment. The programme's principal focus is on microbiological and chemical risk assessment. SAFOSO is leading and implementing the 3 weeks Induction Training in EFSA HQ focused on

the general food safety framework, statistics and modelling, quantitative microbiological and chemical risk assessment.
Relevance: Quantitative MRA modelling is the focus of the training.
Skills: statistics, modelling, quantitative Microbiological Risk Assessment

3) Ecology from Farm to Fork of microbial drug Resistance and Transmission (EFFORT)
(http://www.effort-against-amr.eu/)
Start date: 1/12/2012
End date: 30/11/2018
Client: European Commission, collaborative funded project under the 7th framework programme (Grant Agreement number 613754)
Partners: The EFFORT consortium was formed up to 20 partners from 10 European countries.

- University of Utrecht (Project coordinator Jaap Wagenaar)
- Stichting Dienst Landbouwkunding Onderzoek (CVI-Netherlands)
- Bundesinstitut fuer Risikobewertung (BFR-Germany)
- Universidad Complutense de Madrid (UCM-Spain)
- Agence Nationale de securite sanitaire de l'alimentation, de l'environment et du travail (ANSES-France)
- Istituto Zooprofilattico sperimentale delle regioni Lazio e Toscana (IZSLT- Italy)
- Vion Food Nederland BV (Vion-Netherlands)
- Universiteit Gent (UGent-Belgium)
- Stiftung Tieraerztliche Hochshule Hannover (TIHO-Germany)
- Danmarks Tekniske Universitet (DTU-Denmark)
- Panstwowy Instytut Weterynaryjny- Panstwowy Instytut Badawzy (NVRI)
- SAFOSO AG (SAFOSO-Switzerland)
- Bulgarian Food Safety AGENCY (NDRVI-Bulgary)
- ARTTIC (ARTTIC-France)
- International Life Sciences Institute European Branch AISBL (ILSI-Belgium)
- PorQ BV (PorQ- Netherlands)
- Intomics A/S (Intomics-Denmark)
- Dylaege Jorgen Lindahl/Q-Vet APS (Ø-Vet-Denmark)
- Vetworks BVBA (Vetworks- Belgium)
- Wageningen University (BEC-Netherlands)

Value: € 9 million
Description: The project aimed to understand the eco-epidemiology of AMR in the food chain and to quantify the AMR exposure of different pathways for humans. SAFOSO was involved in the development of models to quantify the exposure to AMR through different transmission routes from animals to humans. For example, SAFOSO developed a risk assessment of the exposure of people to MRSA from dogs. SAFOSO was also involved in the development of an occupational exposure of ARGs in pig slaughterhouse workers and in the development of a quantitative exposure assessment of consumers to specific ARGs attributed to retail meat in European countries.
Relevance: Results from the projects provided scientific evidence to inform decision makers, the scientific community and other relevant stakeholders about the consequences of AMR in the food chain.
Skills: food safety risk analysis, molecular biology, modelling

B. NAMED STAFF MEMBERS AND DETAILS OF THEIR SPECIALISM AND EXPERTISE

For each participating organisation on the project team please list:- the names and grades of all staff who will work on the project together with details of their specialism and expertise, their role in the project and details of up to 4 of their most recent, relevant published peer reviewed papers (where applicable). If new staff will be hired to deliver the project, please detail their grade, area/(s) of specialism and their role in the project team.

Lead Applicant	Ausvet Europe

Named staff members, details of specialism and expertise.

[redacted]

[redacted]

Participant Organisation 1	[redacted]

Named staff members, details of specialism and expertise.

[redacted]

[redacted]

Participant Organisation 2	[redacted]

Named staff members, details of specialism and expertise.

[redacted]

C. STAFF EFFORT

In the table below, please detail the staff time to be spent on the project (for every person named in section above) and their role in delivering the proposal If new staff will be hired in order to deliver the project please include their grade, name and the staff effort required.

Name and Role of Person where known/ Role of person to be recruited	Working hours per staff member on this project

[redacted]	[redacted]

5: PROJECT MANAGEMENT

The project will be led by Dr Angus Cameron from Ausvet Europe, and Dr Céline Faverjon will be the primary Point of Contact for the client. Project co-lead at SAFOSO is Marco De Nardi.

Meetings with the client
All Ausvet projects are undertaken with a high degree of consultation and communication with all key stakeholders, to ensure the project's sustainability and success. Regularly utilising a wide variety of communication methods including face-to-face, teleconference, video-conference and instant messaging (note this is not an exhaustive list) we ensure effective engagement with all of our clients and key stakeholders to ensure that communication does not present a barrier to meeting their needs and effecting successful project delivery.

A virtual kick-off meeting with the client is envisaged at the earliest time convenient after conclusion of the contract to discuss and agree the work plan, discuss and agree data gathering activities and contacts with industry partners and any other relevant issues.

Intermediate regular skype/telephone meetings will be scheduled to discuss intermediate deliveries and enable the integration of feedback in future work. In particular, intermediate skype/telephone meetings are envisaged after the completion of each deliverables.

A final face-to-face meeting with the client is envisaged to present the models for both value chains and to train selected staff members of the client on the use and possibilities for adaptation of the models.

Project team coordination
In the initial stages of the project, the project team will have weekly Skype meetings to discuss project progress and any newly identified risks and to resolve issues as required. After the initial stage, biweekly skype meetings will be organized.

Internal quality assurance
The team will be supported by Ausvet's project management office, which is led by an internationally accredited project manager (PfMP®, PgMP®, CSSBBTM, CSSGBTM, PMI-RMP® and PMP®). Ausvet follows a life cycle approach for project management where risk identification is the key process undertaken during project initiation. Risk management is embedded in the project management cycle which contributes to successful completion of our projects. Our project management team help ensure projects are delivered on time and to the highest quality, by reviewing and forecasting required resource allocation and work progress on a weekly basis in partnership with our senior epidemiology team.

Since 2017 all Ausvet projects have been managed through the Project Management Office (PMO) in accordance with the defined best practices by the Project Management Institute. We have a project scheduling and management system which enables us to prepare realistic schedules by breaking down the activities to the lowest level using the work breakdown structure. The activities are then sorted using a project schedule network diagram. Continuous monitoring ensures that the activities are performed in accordance with the baseline. There has never been an instance of adverse action such as assessment of liquidated damages or any kind of notice of delay. Ausvet takes pride in proactive risk management which ensure that all of its projects are delivered well within project constraints.

In order to plan, monitor and manage projects effectively we will use a number of Project Management Information Systems (PMIS):

- Omniplan - project planning software to plan project activities, create Gantt charts and to develop robust project cost projections (used at bid estimation/project planning stage);
- Mavenlink - to develop comprehensive project plans and to monitor progress status of each individual task, and the project as a whole. We monitor these versus project timeline, resources and budget to ensure we achieve desired project outcomes and deliver successful projects which meet the needs of our clients; and
- Xero - accounting software.

We also have a number of procedures in place to assure project performance and the quality of deliverables and use a variety of mechanisms that enable us to track the delivery of and manage our solutions to deliver high quality services and continuous improvement. These include:

- A robust Project Management Procedure;
- Project and business risk analysis;
- Taking time to ensure well-defined deliverables are agreed with each client during project planning phases and clearly detailed in a project agreement;
- Using our project variation agreement where the client requests changes to project deliverables;
- Working closely with our clients during all project phases;
- Internal independent review process by senior/executive staff prior to finalisation and submission of deliverables;
- Continuous improvement of quality assurance processes; and
- Training of all Ausvet consultants and project staff in project management through the Project Management Institute.

As evidence of the effectiveness of our systems and procedures, we are pleased to note that we have delivered all projects on time and to client budget in past 12 months.

External quality assurance

To assure quality, an international advisory board with three experts in the respective areas of quantitative food safety risk assessment, antimicrobial resistance, and UK industry will be established.

Skype meetings between the project team and the advisory board will be scheduled at critical time points during the project, including but not limited to a kick-off meeting, and towards the completion of each deliverables.

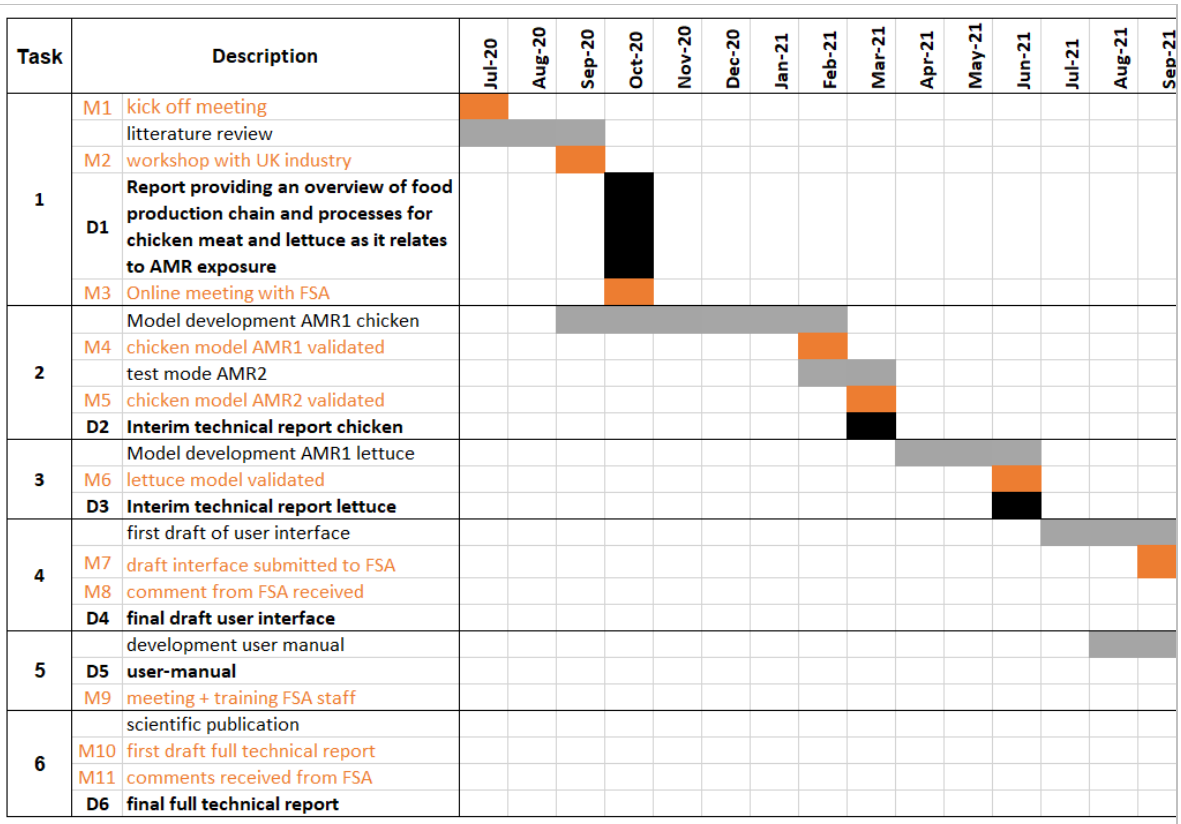
List of experts who agreed to be part of the advisory board of the project:

- Dr Daniel Parker, veterinary advisor to the British Poultry Council (UK) – expertise: UK poultry industry
- Dr Lucie Collineau, veterinary epidemiologist at ANSES, the French agency for food, environmental and occupational health and safety (France) – expertise: quantitative food safety risk assessment and antimicrobial resistance
- Prof. Jim Monaghan, director of the Fresh Produce Centre at Harper Adams University (UK) – expertise: Food safety in the UK crop production

Implementation of a data sharing mechanisms

As part of the data acquisition and management activities the project will use a project management tool to archive and share project documents, datasets and facilitate the communication within the consortium under a protected and user restricted framework.

Gantt chart



6. RISK MANAGEMENT

In the table provided, please identify all relevant risks in delivering this project on time and to budget. Briefly outline what steps will be taken to minimise these risks and how they will be managed by the project team. Please add more lines as required

Identified risk	Likelihood of risk (high, medium, low)	Impact of Risk (high, medium, low)	Risk management strategy
A major disease epidemic/outbreak (e.g., Covid19) could result in: ● FSA staff or target stakeholders being seconded to other work areas and/or not available for contribute ● Lack of work force	Medium	High	● Negotiate an extension in the project timelines ● Possibility to work from home
Unable to arrange convenient dates for the workshop	Medium	Medium	● Arrange one or two additional dates for the online workshop ● Set up a date for the workshop as soon as the list of participants is known.
Low engagement of industry partner (concern about data security, or data protection) because we are not UK companies	Low	Low	● Involve the advisory board (especially Dr Daniel Parker, veterinary advisor to the British Poultry Council and Prof. Jim Monaghan, director of the Fresh Produce Centre at Harper Adams University) in the identification of key UK industry representatives ● Involve the FSA in communication with their network

			• Importance of confidentiality and the way data are shared within this specific project will be presented (and discussed) at the very beginning of the workshop with UK industry
Data availability limited for prevalence of microorganism and presence of ARG	Medium-high	Medium	• Use of non-UK data and/or data related to other microorganisms and ARG • Development of a guideline to deal with missing data • If some important data are missing, the project partners will implement an expert elicitation based on their respective professional networks (e.g., experts from the EFFORT and Fleming fund projects) in order to obtain the best possible information for the AMR of interest given the current state of knowledge. • If the lack of data is critical, the project team might propose at the end of task1 to develop a simplified version of the modelling framework. This will be implemented in agreement with FSA.
Capacity and capability to deliver the project impacted by staff unavailability e.g. Key project staff not available because of change of position, illness etc.	Low	Medium	• Appropriately qualified staff with equivalent skills are available within Ausvet or SAFOSO to take over work if necessary. • Change of staff (using new staff with similar qualifications) will be notified to FSA at least 3 weeks in advance and the credentials of the new staff will be supplied to FSA. • Maintain work progress in a clear format suitable for staff substitution if required.

7. QUALITY MANAGEMENT

A. QUALITY MANAGEMENT

Ensuring that we deliver quality services and products to our clients is an important priority for us, as such Ausvet strives to ensure that it has robust quality assurance which leads to continual service improvement. Although we do not currently have an ISO quality management certification our Quality Assurance and Control Manager is working to develop a quality management framework that is in line with ISO requirements; this will be compiled in conjunction with other relevant agencies and including government bodies. The aim of this exercise is to provide a more robust and sustainable approach that meets both our needs and those of our clients, including the assurance of quality client interaction and project outputs.

We currently use a number of mechanisms that enable us to deliver high quality services and continuous improvement, including: a robust Project Management Procedure; project and business risk analysis; and internal independent review process by senior staff prior to finalisation and submission of deliverables. Together, these provide a framework for quality assurance, best practice and performance management at project and sector level.

Quality Assurance Procedures
We have a number of procedures in place to assure project performance and the quality of deliverables and use a variety of mechanisms that enable us to track the delivery of and manage our solutions to deliver high quality services and continuous improvement. These include:

- A robust Project Management Procedure;
- Project and business risk analysis;
- Taking time to ensure well-defined deliverables are agreed with each client during project planning phases and clearly detailed in a project agreement;
- Using our project variation agreement where the client requests changes to project deliverables;
- Working closely with our clients during all project phases;
- Internal independent review process by senior/executive staff prior to finalisation and submission of deliverables;

- Continuous improvement of quality assurance processes; and
- Training of all Ausvet consultants and project staff in project management through the Project Management Institute.

Feedback and complaints

Ensuring that our clients receive excellent service is an important priority for us, as such Ausvet encourage all feedback from our clients to ensure we deliver quality services and products. We employ a two-stage complaints procedure:

- Attempts are made to resolve complaints locally in the first instance through the Senior Consultant and/or Project Coordinator/Manager;
- Those complaints which cannot be resolved using problem-solving processes locally are escalated to a project designated Quality Assurance and Control Manager, who is part of our senior executive team, for investigation, review and resolution.

As evidence of the effectiveness of our systems and procedures, we are pleased to note that we have delivered all projects on time and to client budget in past 12 months.

Work supplied by sub-contractors

Ausvet consultants have the demonstrated capacity to work effectively to lead and manage teams of varied size across large geographies; approximately 40% of the projects we deliver involve the management of subcontractors. Having extensive experience in managing a diverse range of subcontractors and key stakeholders to deliver high quality deliverables to a wide range of clients, often in challenging timeframes; our managers have developed the range of skills required to lead both large and small teams effectively. For example leading 10 authors from 2 different Universities to deliver a landmark review of health security in 22 countries in Southeast Asia and the Pacific, ‘Report on The State of Health Security in the Indo-Pacific Region’ commissioned by the Australian Government Indo-Pacific Centre for Health Security.

To effectively assure subcontractor performance and ensure the quality of project deliverables our relationships with subcontractors are governed by subcontractor agreements; these are tailored to encompass the requirements of each project and to clearly define the role and responsibilities of each subcontractor.

Further we take the time to clearly communicate, define and agree: roles; responsibilities; and deliverables together with key management components such as timeframes, communication channels and project risk responsibility etc. during the Pre-Project Initiation and Project Planning phases of each project. This is key to ensuring that all sub-contractors understand their role in the context of the wider project; that they have a very clear understanding of all requirements; together with all the information they need to do their job safely, on schedule and to the required standard.

We schedule reviews of performance against risks/tasks as required and at key project milestones. Further to assist team working, we utilise systems which aid collaborative and transparent working e.g. Google Drive.

Compliance with the Joint Code of Practice for Research (JCoPR)

As outlined in this application our systems and procedures (including Quality Assurance, Project Management and Data Protection) allow Ausvet to ensure compliance with the Joint Code of Practice for Research (JCoPR):

Responsibilities	Project management responsibility is designated as per our Project Management Procedure. Pre-Project Initiation Meetings take place upon contract award to determine and ensure compliance of each prospective project. During pre-project initiation resources are planned to projects by role. Kick off Meeting (Planning Phase) takes place upon contract award and contract signing. High-level tasks are broken down into more detailed sub-tasks through planning meetings between the project manager and the technical lead, and each task is given a priority level by the technical lead. Resources are assigned to complete these tasks within the estimated duration. Clear line management designation is communicated and discussed with all members of each project team by the technical lead, to ensure clarity and to define regular supervision and support. Project role of each staff is clearly defined in the project plan. Our Project Management Information Systems (PMIS). Mavenlink is used to allocate resources (using 'Resource Planner' task assignment) and to monitor progress status of each individual task/responsibility, and the project as a whole. These are monitored versus project timeline, resources and budget to ensure we achieve desired project outcomes and deliver successful projects which meet the needs of our clients within agreed timeframes.
Competence	CV's for each member of the project team are held securely on our systems. Further Ausvet staff qualifications, skillset and training records are captured on our intranet via our prescribed human resources procedures. These profiles are regularly updated by all staff. We will ensure that all project staff have visibility of, and understand their obligation, to comply with the JCoPR. We will capture record of this understanding and hold securely with each team member CV. Project supervision and wider company supervision is undertaken by line managers on a regular basis as defined by our human resources procedures to identify need, and to provision access to, extensive development and training opportunities.
Project planning	Ausvet follows a life cycle approach for project management where risk identification is the key process undertaken during project initiation. Risk management is embedded in the project management cycle which contributes to successful completion of our projects. Our project management team help ensure projects are delivered on time and to the highest quality, by reviewing and forecasting required resource allocation and work progress on a weekly basis in partnership with our senior epidemiology team. Our PMIS Mavenlink captures Resource Scheduling in Task Tracker, with hours and budgets set to individual tasks and milestones. Meaning that as these are reviewed by our Project Manager and Technical lead these are consistently recorded and updated as required. This project will not involve any sampling of materials nor ethical approval.

Quality Control	We have a number of procedures in place to assure project performance and the quality of deliverables and use a variety of mechanisms that enable us to track the delivery of and manage our solutions to deliver high quality services and continuous improvement. These include: ● A robust Project Management Procedure; ● Project and business risk analysis; ● Taking time to ensure well-defined deliverables are agreed with each client during project planning phases and clearly detailed in a project agreement; ● Using our project variation agreement where the client requests changes to project deliverables; ● Working closely with our clients during all project phases; ● Internal independent review process by senior/executive staff prior to finalisation and submission of deliverables; ● Continuous improvement of quality assurance processes; and ● Training of all Ausvet consultants and project staff in project management through the Project Management Institute.
Health and Safety	Ausvet have a documented Health and Safety policy which governs all aspects of our business and all of our business locations. We conduct annual workplace audits to ensure the safety and wellbeing of our staff and provision guidance and advice to all staff with regards the type of work health and safety hazards which could impact them while performing their role. Further, risk identification is a key process undertaken during project initiation to identify any specific risk including that in relation to any aspect of health and safety is recognised to ensure that appropriate mitigation or management of that risk implemented.
Handling of samples and materials	No samples will be collected, nor experimental materials used, as part of this project
Facilities and equipment	Ausvet maintain an Accident and Hazard register and conduct annual workplace audits to ensure the safety and wellbeing of our staff. Plant and equipment are regularly tested. As part of this process we conduct annual testing and tagging of all electrical equipment in each office and also have our fire safety equipment tested annually. Records are maintained at office sites to this effect.
Documentation of procedures and methods	Version control is managed automatically through our use of systems such as Google Drive which provisions automated version control. The utilisation of Google Drive in conjunction with Google Docs enables easy collaboration in real-time; allowing all team members to make their changes directly into the same document at the same time. Other team members are able to see who is in the document at any time and also view their changes in real-time, preventing traditional issues around documentation duplication and confusion with version control. Versions can be named using Google Docs to ensure no file duplication is made. This facility/system also enables/facilitates version restoration, or version comparison with ease should it be required. Google Docs will be easily linked to Basecamp.

Research/work records	No laboratory facilities exist. A project management tool (e.g. Basecamp or similar) which will be used to archive and share project documents, datasets and facilitate the communication within the consortium under a protected and user restricted framework. Google Drive will be used to store and secure all files and documents created in relation to this project. Technical lead staff provide regular (weekly) review of project process, documentation and progress throughout each project to ensure the validity of work. Please refer sections in response C. DATA PROTECTION to see specific detail around Data storage, Systems, Data Transfer and Disclosure and Access.
Field based research	There will be no field based research undertaken in relation to this project

B. ETHICS

No ethical issues have been identified in relation to the delivery of this project.

C. DATA PROTECTION

Although this project will not involve the collection of any sensitive and/or personal data not already in the public domain the (publicly available) Ausvet Group Privacy Policy, together with our internal procedures, will at all times govern the way in which we collect, disclose and store information in relation to this project.

The Ausvet Group Privacy Policy is regularly reviewed. Recently it was revised following the establishment of Ausvet Europe, and to ensure compliance with the EU GDPR and UK Data Protection Act 2018 (as amended), and we have reviewed and understand “the UK GDPR” means Regulation (EU) 2016/679 of the European Parliament and of the Council of 27th April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data (General Data Protection Regulation) as it forms part of the law of England and Wales, Scotland and Northern Ireland by virtue of section 3 of the European Union (Withdrawal) Act 2018. We note that Switzerland has already completed an adequacy decision with the European Commission. We are aware of the role of the Information Commissioner’s Office (ICO) and how this will change at the end of the transitional period (December 2020). Specific examples of measures in place to ensure our compliance with this legislation include:

- Adoption of the principle of privacy by design into all aspects of the company.
- Appointment of an Ausvet Europe data protection officer (Director General).
- Implementation of internal procedures to ensure any data breach is identified and notified within 72 hours.
- Introduction of consent forms.

Internal procedures complement our policy and act as a guide for all staff. This includes what to do if there has been a breach, and who to contact to make a complaint. Ausvet's designated Privacy Officer is the Manager Corporate Services. They are responsible for driving our privacy agenda in terms of creating a culture of awareness around our privacy obligations, and also for ensuring company-wide compliance. They also work with our IT team to ensure compliance with data protection laws and regulations.

We note that although there is little material difference between the EU GDPR and the UK GDPR that during the transition period both currently apply to data protection, privacy and electronic communications in relation to this project, and that upon the UK’s exit from the EU that the UK GDPR will continue to apply, as such we will ensure compliance with both legislation, and would commit to ensure compliance with any new legislation enacted thereafter as soon as is practicable.

General Privacy Policy Principles

- Personal information collected by Ausvet is treated as confidential and is protected by the applicable legislation in the countries in which we operate.
- When a person provides Ausvet with personal information, they consent to having it collected, maintained, used and disclosed in accordance with this Privacy Policy.
- All information sourced by Ausvet is used for our business purposes only, which are detailed broadly in

our Privacy Policy.

We do not collect any personal information through our website unless it is provided directly to us, and we only use personal information for the purpose for which it was originally provided, unless mutually agreed otherwise. Ausvet will not disclose personal information unless we have the specific consent of the person, or unless we are specifically required to by law.

Systems and Processes – Handling, Processing and Holding Data Securely

Data storage

All information is stored securely for a reasonable period of time. We take steps to protect the personal information we hold against loss, unauthorised access, use, modification or disclosure and against other misuse. Where personally identifying information is supplied to us but is not required to undertake our work, we may erase unnecessary data items. Access to information stored electronically is restricted to employees whose job requires such access, and we require all staff to maintain the confidentiality of personal information. Personal information is destroyed when no longer required in accordance with applicable legislation. Personal information and data are often stored in international locations that have independent privacy laws and are not governed or associated by Australian or European law or policies. In these cases, we take steps to ensure close compliance with our own operation. Ausvet deletes personal information in a secure manner once it is no longer needed or required to be kept by law.

Systems

Digital information is used only on password/biometric secured laptops or for substantial analyses in AWS cloud compute facilities. Although we use end-to-end encrypted email and message services, data is only transferred using Google Drive or AWS S3 storage solutions, both of which provide SSL/TLS tunnels for data transfer, and AES-256 encryption for data at rest. Local backups of laptop hard drives are also encrypted, however preference is given to using cloud resources. Google Drive and Amazon Web Services both have ISO 27001, 27017 and 27018 certification as well as HIPAA and SOC1-2-3 compliance. Ausvet will only use the AWS London region for data which may contain information relating to an identified or identifiable natural person. Amazon AWS services compliance with GDPR is demonstrated by the availability of access through the UK G-Cloud 11 framework. Our process are also covered by irap (Australia) for compliance with the Australian Government Information Security Manual.

As part of the data acquisition and management activities this project will acquire a project management tool (e.g. Basecamp or similar) which will be used to archive and share project documents, datasets and facilitate the communication within the consortium under a protected and user restricted framework. As such Ausvet and our subcontractors will enter into a GDPR-compliant data processing agreement with Basecamp (or any other provider). This standard Data Processing Addendum (DPA) will extend GDPR privacy principles, rights and obligations everywhere relevant data is processed. Basecamp uses third party subprocessors, such as cloud computing providers and customer support software, to provide services and enter into GDPR-compliant data processing agreements with each subprocessor, requiring the same of them.

All handheld devices (i.e. smart phones and laptops), are only accessed through a secure network with staff utilising an LT2P VPN when away from their office.

Data Transfer And Disclosure of Information to Third Parties and Overseas Recipients

We only disclose personal information in very limited circumstances and with approval (e.g. disclosure to organisations that provide us with professional advice, such as solicitors and accountants or to contractors to whom we outsource functions. However, where possible, we take contractual measures, and, in all other circumstances, take all reasonable measures, to ensure that third parties comply with the privacy standards set out in the applicable legislation.

Access

Clients and data subjects may access the personal information we hold about them, and can ask us to correct the personal information we hold about them at any time. In rare circumstances, and only where it is permitted under the relevant legislation we may not be able to provide them with access to their information, for example, where it will have an unreasonable impact upon the privacy of others, where it relates to legal proceedings between us through which the information would not otherwise be available, where it would be prejudicial to negotiations we are holding with them, where we are required by law to withhold the information, or where it would reveal information relating to our commercially sensitive decision making processes. If we are unable to provide clients or data subjects with access, we will state why this is so and consider whether the use of an intermediary would be appropriate.

Within Ausvet only project staff have access to folders containing commercial and/or personal information. All supplied and processed data containing commercial and/or personal information is erased at project completion. All subcontractors are contractually obliged to meet the same requirements as Ausvet. Further, access may be monitored or audited as required as file view, deletion and modification is enabled through

both Google Drive and AWS CloudTrail.

Data Protection Impact Assessment (Dpia)
Data Protection Impact Assessments (DPIA) are carried out before Ausvet collect, use or process personal information to assess potential privacy risk to data subject. Our Privacy Officer conducts a DPIA whenever we change our internal processes in relation to how we store, disclose or access personal information. The Privacy Officer also works with Project Leads to conduct a DPIA before the commencement of any new project or service where personal data is involved. Ausvet DPIAs are based on the template provided by the UK ICO (https://ico.org.uk/media/for-organisations/documents/2553993/dpia-template.docx), but are also undertaken in accordance with the 10 step process described by the Australian Government's Office of the Australian Information Commissioner.

Risk Management
Ausvet is developing an information security management system (ISMS), to serve as one-point solution to address both IT/data security as well as non-IT information assets. We recently conducted Project Management Institute (pmi.org) risk management training for all staff. information security was part of this training. All information created, sent and received as part of our work becomes part of official record. We follow defined risk management methodology archiving information and recording/limiting access on need to know basis. During any project, staff responsible for preparing information or undertaking analyses assess whether information is sensitive or needs to be secured. Once classified it is only shared with authorised team members.

Assessment and evaluation of measures and risk
Ausvet frequently examine the organisations information security risks, threats, vulnerabilities and its impacts. A comprehensive risk management strategy is overseen by the board, and periodically updated based on the outcome of these assessments. Ausvet is familiar with the ISO 27001 ISMS controls (2013) as we are also implementing a quality control system, though is not currently certified under this standard.

D. SUSTAINABILITY

The Food Standards Agency is committed to improving sustainability in the management of operations. Procurement looks to its suppliers to help achieve this goal. You will need to demonstrate your approach to sustainability, in particular how you will apply it to this project taking into account economic, environmental and social aspects. This will be considered as part of our selection process and you must upload your organisations sustainability policies into the eligibility criteria in Bravo.
Please state what(if any) environmental certification you hold or briefly describe your current Environmental Management System (EMS)

Given that Ausvet's work is inherently staff based with any equipment or services essentially incidental to that work, having assessed the situation, and believing that our current sustainable practice is of a good standard, we do not believe that material additional reductions in our environmental footprint would be gained from extending staff advice into an Environmental Management System (EMS). As an SME we cannot justify further investment of time or cost in implementing such a system, as we do not believe that the incremental cost outweighs the incremental benefit. To ensure that our business practices remain current and innovative however, each year we attend the Business Sustainability Expo held in Canberra to gain new insights.

Although Ausvet does not have a formal environmental management system, we are committed to carefully considering the business economic, environmental and social impacts of our work, and to developing a strategic approach to sustainability. Moreover we recognise the benefits that an emphasis on sustainable development can bring to all stakeholders to whom we deliver, and/or are impacted by our services and projects, as such social responsibility is one of Ausvet's core values. We are committed to sustainable practices and carefully considering and managing the economic, environmental and social impact of our services, and the projects that we deliver. Considering the impact of these on our stakeholders and the wider global community as a whole we consider the impact and sustainability of each project, and support and encourage responsible practices through a variety of means:

- Encouraging a diverse supplier base
- Promoting fair employment practices
- Promoting workforce welfare
- Promoting community benefits
- Encouraging ethical sourcing practices
- Promoting greater environmental sustainability

In addition, we encourage and/or promote:

- Avoiding pollution of our environment by taking prudent steps to prevent generation of waste in the first place, and where this cannot be achieved, minimising the use of non-renewable materials and using recycled products and packaging where possible. In 2018, we won a 'Highly Commended' award in the category of Waste Minimization in the annual ACTSmart Business Recycling Awards. Practices we

employ include:

- Encouraging printing to be minimal through the provision of information electronically.
- Encouraging staff to utilise their own IT and communications equipment where practicable, for example by provisioning a mobile plan reimbursement scheme to reduce the growing worldwide problem/volume of electronic equipment waste driven by obsolete/outdated devices.
- Recycling or composting all items as a matter of course.
- Where disposal of waste cannot be avoided, we ensure disposal of it in a safe and responsible manner. Our adopted practices ensure that less than 5% of our office waste goes to landfill.

- Minimising travel where appropriate and practicable, through greater use of electronic media, and investment in a wide range of communication means including teleconference, video-conference and instant messaging (note this is not an exhaustive list). This investment continues to ensure that Ausvet projects are undertaken with a high degree of consultation and communication with all key stakeholders to ensure the project's sustainability and success. Where travel is necessary, we seek to undertake it in as energy efficient manner as possible, including the promotion of public transport and cycling.
- Managing and maintaining equipment and the property in an environmentally sensitive manner, seeking to improve its energy efficiency through appropriate investment. Our Canberra office was the first building in the ACT (and third in Australia), to achieve a 6-star environmentally-sustainable rating.
- The consideration of the social and economic impacts of our work and the projects we deliver through our employment of in-house sociology experts. Though our team is led by epidemiologists we take a strong multidisciplinary approach; as experience has demonstrated that the challenges of improving health in the face of severe resource and logistical constraints requires a range of expertise. For example Ausvet designed and delivered the world-class health information system iSIKHNAS, based on a user-centred philosophy. This system focused on generating meaningful user benefits to address previously intractable problems of slow, expensive surveillance with high levels of under-reporting, to create an effective, sustainable system which has set new standards in terms of coverage, and speed of reporting and is now fully and sustainably funded by the Indonesian government. Further Ausvet promoted equality through the provision of gender-balanced training to system coordinators at provincial and district levels.

E. DISSEMINATION AND EXPLOITATION (Science Projects Only)

Where applicable please indicate how you intend to disseminate the results of this project, including written and verbal communication routes if appropriate. Applicants are advised to think carefully about how their research aligns with the FSA strategy, what is the impact that their research has on public health/ consumers and decide how the results can best be communicated to the relevant and appropriate people and organisations in as cost-effective manner as possible. Please provide as much detail as possible on what will be delivered. Any costs associated with this must be documented in the Financial Template.

The applicant should describe plans for the dissemination of the results for the project team as a whole and for individual participants. Details should include anticipated numbers of publications in refereed journals, articles in trade journals etc., presentations or demonstrations to the scientific community, trade organisations and internal reports or publications. Plans to make any information and/or reports available on the internet with the FSA's permission are also useful, however, this does not remove the requirement for Tenderers to think how best to target the output to relevant groups.
If a final report is part of the requirement, please make sure, as part of the executive summary, that aims and results are clear to the general audience and that the impact of the research on public health/consumers and it's alignment to FSA priorities is clearly stated.

Please note that permission to publish or to present findings from work supported by the FSA must be sought in advance from the relevant FSA Project Officer. The financial support of the FSA must also be acknowledged.

Please indicate whether any Intellectual Property (IP) may be generated by this project and how this could be exploited. Please be aware the FSA retains all rights to the intellectual property generated by any contract and where appropriate may exploit the IP generated for the benefit of public health.
In this part Applicants should demonstrate the credibility of the partnership for exploitation of the results and explain the partnership's policy in respect of securing patents or granting licenses for the technology (if applicable). It should deal with any possible agreements between the partners to extend their co-operation in the exploitation phase and with relevant agreements with companies, in particular users, external to the partnership

The project team will deliver 3 interim internal reports and one final technical report for FSA:

- Interim report 1: critical risk pathways for AMR through the food production chain of chicken meat and lettuce in UK
- Interim report 2: chicken model
- Interim report 3: lettuce model
- Final report: full technical description of the modelling framework

These reports intend to be technical and will focus on providing all information needed to FSA staff to understand and use the modelling framework developed during the project.

The outputs of the project will be presented to a more general audience at the very end of the project. The closure meeting will involve FSA staff, decision makers and key UK industry representative.

The project team will also aim at publishing one scientific paper in a peer-reviewed scientific journal.

SCHEDULE 4

PRICING

This Schedule 4 specifies the Ordered Services to be provided to the Client by the Supplier in the services required for FS307037

Introduction

1.1 This Schedule 4 sets out the Basis of Charging that shall apply to this Contract and any attendant Purchase Orders.

1.1. Other than as provided in this schedule, or agreed in writing in a relevant Purchase Order no additional Charges shall be payable by the Client to the Supplier for any additional costs associated with the execution of the Services or the Deliverables, including, without limitation, administrative and overhead costs.

2. BASIC PRINCIPLES

2.1 In general, all prices charged by the Supplier to the Client for all services (Support and Development) throughout the duration of this agreement shall be calculated from the Charges Schedule:

2.2 In addition the Client will reimburse travel and subsistence expenses which are reasonable and agreed in advance as set out in the table below, **where Tenderers have indicated such expenses will be applicable within their Qualifications to** Schedule 7, Charges:

Expenses	**Reimbursement**
Rail travel	Standard class
Mileage	£0.45 per mile for the first 10,000 miles in a financial year £0.25 per mile for any mileage in excess of 10,000 miles in a financial year
Overnight hotel accommodation	Up to £85 per night outside London Up to £130 per night in London
Subsistence	Up to a maximum of £21 for a 24-hour period

Suppliers Financial Proposal:

Will you charge the Agency VAT on this proposal?	No
Please state your VAT registration number:	FR89848821062

Project Costs Summary Breakdown by Participating Organisations
Please include only the cost to the FSA.

Organisation	VAT Code*	Total (£)
Ausvet Europe	EXEMPT	£ [redacted]
Safoso	EXEMPT	£ [redacted]
Utrecht University	EXEMPT	£ [redacted]

Total Project Costs (excluding VAT) **	**£**	**150,000.00**

Project Costs Summary

Staff Costs	**£**	[redacted]
Overhead Costs	**£**	**-**
Consumables and Other Costs	**£**	**-**
Travel and Subsistence Costs	**£**	[redacted]
Other Costs - Part 1	**£**	[redacted]

Total Project Costs	**£**	**150,000.00**

Staff Costs Table

*This should reflect details entered in your technical application section 4C.
Please note that FSA is willing to accept pay rates based upon average pay costs. You will need to indicate where these have been used.

* Role or Position within the project	Participating Organisation	Daily Rate (£/Day)	* Daily Overhead Rate(£/Day)	Days to be spent on the project by all staff at this grade	**Total Cost (incl. overheads)**
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
					£ -

Total Labour Costs	[redacted]
* Total Overhead Costs (if not shown above)	

Consumable/Equipment Costs

Description and justification of the cost	Estimated Cost
Contingency - see risk matrix	£ [redacted]

Travel and Subsistence Costs

Please provide a breakdown of the travel and subsistence costs you expect to incur during the project

Purpose of journey or description of subsistence cost	Frequency	Cost each (£)	Total Cost
[redacted]	[redacted]	[redacted]	[redacted]

Total Travel and Subsistence Costs	£ [redacted]

The Pricing Schedule

Proposed Project Start Date	01-Jun-2020	Amount				
Invoice Due Date	Description as to which deliverables this invoice will refer to (*Please include the deliverable ref no(s) as appropriate)*	*Net	** VAT Code	§ Duration from start of project (Weeks)	§ Duration from start of project (Date)	Financial Year
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Retention/Final Deliverable	***	**£** [redacted]				

Total	**£ 150,000.00**

Summary of Payments

	Year 2	Year 3		
Financial Year (Update as applicable in YYYY-YY format)	2020-21	2021-22	Retention	Total
Total Amount	[redacted]	£ [redacted]	£ [redacted]	**£ 150,000.00**

SCHEDULE 5

INVOICING PROCEDURE & NO PO/NO PAY

1. INVOICES SHALL SPECIFY:

- Trading Name of Supplier
- Supplier Address
- Supplier Tel Number/ E mail
- Unique Purchase Order Number – To be advised
- Invoice Number
- Detailed description of the Services provided
- Detailed description of any expenses and the amounts of such
- Location, date or time period of delivery of the Services and/or Deliverables
- Supplier's VAT number
- Amount due exclusive of VAT, other duty or early settlement discount, with the calculation for the charges clearly shown in terms of days and confirmed daily rate
- VAT rate
- Amount due inclusive of VAT and any other duty or early settlement discount
- Details of the Supplier's BACS details or other method of payment
- Date of the invoice.

2. INVOICE SUBMITTAL

Invoicing the FSA:

Please submit invoices to [redacted] for work with FSA.

Please include the referring FSA purchase order number in the email title and within the invoice to allow Invoice/Purchase Order matching.

Note that invoices that do not include reference to FSA Purchase Order number will be returned unpaid with a request for valid purchase order through email.

3. INVOICE PAYMENT

3.1 The Client shall pay all valid invoices submitted in accordance with the provisions of this Schedule 3 in accordance with the provisions of Clause 7.

3.2 In the event of a disputed invoice, the Client shall make payment in respect of any undisputed amount in accordance with the provisions of Clause 7 and return the invoice to the Supplier within ten (10) Working Days of receipt with a covering statement proposing amendments to the invoice and/or the reason for any non-payment. The Supplier shall respond within ten (10) Working Days of receipt of the returned invoice stating whether or not the Supplier accepts the Client proposed amendments. If it does then the Supplier shall supply with the response a replacement valid invoice. If it does not then the matter shall be dealt with in accordance with the provisions of Clause 18.

3.3 **NO PURCHASE ORDER, NO PAY.**

The Food Standards Agency is currently moving purchasing activity to an electronic purchasing solution. This brings supplier organizations a number of benefits, including limiting purchasing to preferred suppliers and faster payment processing.

To implement the solution, the undernoted changes will be implemented with effect from the contract commencement date.

To prevent unauthorised individuals requesting goods and services only FSA branded Purchase Orders from these email addresses should be accepted as FSA commitment: SSDprocurementagencies@defra.gsi.gov.uk; OR fsa.procurement@food.gov.uk. The FSA will not pay invoices that do not originate from Purchase Orders from these email addresses.

Any other requests for goods or services from the FSA should be referred to the Procurement Business Partner.

4. CORRESPONDENCE

Correspondence to the Client relating to this Contract (but not the invoice) shall be appropriately referenced and sent to the following address:

[redacted]

SCHEDULE 6

DISPUTE RESOLUTION PROCEDURE

1. INTRODUCTION

1.1. In the event that a dispute cannot be resolved by the Client and Supplier representatives nominated under Clause 18.2 within a maximum of ten (10) Working Days after referral, the dispute shall be further referred to mediation in accordance with the provisions of Clause 18.4.

1.2. Subject always to the provisions of Clause 21, nothing in this dispute resolution procedure shall prevent the Client or the Supplier from seeking from any court of the competent jurisdiction an interim order restraining the other party from doing any act or compelling the other to do any act.

2. MEDIATION

2.1. The procedure for mediation pursuant to Clause 18 and consequential provisions relating to mediation shall be as follows:

2.1.1. a neutral adviser or mediator ('the Mediator') shall be chosen by agreement between the Client and the Supplier or, if they are unable to agree upon the identity of the Mediator within ten (10) Working Days after a request by one party to the other (provided that there remains agreement for mediation), or if the Mediator agreed upon is unable or unwilling to act, either party shall within ten (10) Working Days from the date of the proposal to appoint a Mediator or within ten (10) Working Days of notice to either party that he is unable or unwilling to act, apply to the Centre for Effective Dispute Resolution ('CEDR') to appoint a Mediator;

2.1.2. the Client and the Supplier shall within ten (10) Working Days of the appointment of the Mediator meet with him in order to agree a programmed for the exchange of all relevant information and the structure to be adopted for negotiations to be held. The parties may at any stage seek assistance from the CEDR to provide guidance on a suitable procedure.

2.2. Unless otherwise agreed by the Client and the Supplier, all negotiations connected with the dispute and any settlement agreement relating to it shall be conducted in confidence and without prejudice to the rights of the parties in any future proceedings.

2.3. In the event that the Client and the Supplier reach agreement on the resolution of the dispute, the agreement shall be reduced to writing and shall be binding on both parties once it is signed by the Client's Head of Procurement and the Supplier.

2.4. Failing agreement, either the Client or Supplier may invite the Mediator to provide a non-binding but informative opinion in writing.

2.5. The Client and the Supplier shall each bear their own costs in relation to any reference made to the Mediator and the fees and all other costs of the Mediator shall be borne jointly in equal proportions by both parties unless otherwise directed by the Mediator.

2.6. Work and activity to be carried out under this Contract shall not cease or be delayed during the mediation process.

2.7. In the event that the Client and the Supplier fail to reach agreement in the structured negotiations within forty (40) Working Days of the Mediator being appointed, or such longer period as may be agreed, then any dispute or difference between them may be referred to the Courts in accordance with the provisions of Clause 41.

SCHEDULE 7

CONFIDENTIALITY UNDERTAKING

1. INTRODUCTION

1.1. This Schedule 7 contains the model confidentiality undertaking to be signed by Supplier in the event of Contract Award.

CONFIDENTIALITY UNDERTAKING

I ***THE SUCCESSFUL TENDERER*** HAVE BEEN INFORMED THAT I MAY BE ASSIGNED TO WORK AS A SUPPLIER IN PROVIDING SERVICES TO THE FOOD STANDARDS AGENCY.

I UNDERSTAND THAT INFORMATION IN THE POSSESSION OF THE CLIENT MUST BE TREATED AS CONFIDENTIAL.

I HEREBY GIVE A FORMAL UNDERTAKING TO THE CLIENT, THAT:

1. I WILL NOT COMMUNICATE ANY OF THAT INFORMATION, OR ANY OTHER KNOWLEDGE I ACQUIRE IN THE COURSE OF MY WORK FOR THE CLIENT TO ANYONE WHO IS NOT AUTHORISED TO RECEIVE IT IN CONNECTION WITH THAT WORK.

2. I WILL NOT MAKE USE OF ANY OF THAT INFORMATION OR KNOWLEDGE FOR ANY PURPOSE OUTSIDE THAT WORK.

I ACKNOWLEDGE THAT THIS APPLIES TO ALL INFORMATION WHICH IS NOT ALREADY A MATTER OF PUBLIC KNOWLEDGE AND THAT IT APPLIES TO BOTH WRITTEN AND ORAL INFORMATION.

I ALSO ACKNOWLEDGE THAT THIS UNDERTAKING WILL CONTINUE TO APPLY AT ALL TIMES IN THE FUTURE, EVEN WHEN THE WORK HAS FINISHED AND WHEN I HAVE LEFT MY EMPLOYMENT.

I HAVE ALSO BEEN INFORMED THAT I WILL BE BOUND BY THE PROVISIONS OF THE OFFICIAL SECRETS ACTS OF 1911 AND 1989. I AM AWARE THAT UNDER THOSE PROVISIONS IT IS A CRIMINAL OFFENCE FOR ANY PERSON EMPLOYED BY A GOVERNMENT SUPPLIER TO DISCLOSE ANY DOCUMENT OR INFORMATION WHICH IS LIKELY TO RESULT IN AN OFFENCE BEING COMMITTED, OR WHICH MIGHT PROVIDE ASSISTANCE IN AN ESCAPE FROM LEGAL CUSTODY OR ANY OTHER ACT AFFECTING THE DETENTION OF PEOPLE IN LEGAL CUSTODY. I AM AWARE THAT SERIOUS CONSEQUENCES MAY FOLLOW FROM ANY BREACH OF THAT ACT.

SIGNED:

NAME:

DATE OF SIGNATURE:

Schedule 8 – Staff Transfer – "TUPE"

Not applicable

Schedule 9 – Commercially Sensitive Information

None identified

Schedule 10 – Variation Notice – Request for Variation

1 General principles of the Variation Procedure

1.1 This Schedule sets out the procedure for instruction and evaluation of Variations to the Framework.

1.2 Under this Variation procedure:

1.2.1 Either party may seek to vary the Service(s) at any time during the Term of the Framework. Each party will do its utmost to give the other reasonable notice of any major changes, preferably a minimum of 3 months' notice, and to respond within the timeframe stated in Clause 24.

1.2.2 Variation requests are to be submitted using the format at Appendix A.

1.2.3 Where a Variation is proposed, the Supplier will provide an estimate of the financial/resource implications to the Client, with an estimated timetable for implementation, for the Client's approval.

1.2.4 The evaluation of any Variation is the responsibility of the relevant Director and Head of Procurement, in consultation with the Supplier, in the context of the Review Meetings described in Governance contained in the Framework. The date of implementation of any consequent amendment to the services, and/or payment to the Supplier, will be confirmed in writing by the Client within seven days of the evaluation using the Variation Form at Appendix B.

1.2.5 The Client shall have the right to request amendments to a Variation Request (prior to approval); approve it or reject it. The Supplier shall be under no obligation to make such amendments to the Variation Request; however, the Supplier shall not unreasonably refuse such a request. In the event that the Client chooses to reject a Variation Request made by the Supplier the Client shall accept responsibility for the outcome.

1.3 Any discussions, negotiations or other communications which may take place between the Client and the Supplier in connection with any proposed variation shall be without prejudice to each party's other rights under this Framework.

2 Costs

2.1 Each party shall bear its own costs in relation to the preparation and agreement of each Variation.

3 Change Authorisation

3.1 Any Variation and/or amendment to payment arising from a Variation will be executed by the Client's Head of Procurement and confirmed in writing to the Supplier.

3.2 The variation shall not be deemed effective until the Variation form at Appendix B has been signed by both parties.

Schedule 11 – Exit Management

None Identified

Schedule 12 Processing, Personal Data and Data Subjects

This Schedule shall be completed by the Controller, who may take account of the view of the Processors, however the final decision as to the content of this Schedule shall be with the Controller at its absolute discretion.

1. The contact details of the Controller's Data Protection Officer are: Jenny Desira, [redacted]

2. The contact details of the Processor's Data Protection Officer are:

3. The Processor shall comply with any further written instructions with respect to processing by the Controller.

4. Any such further instructions shall be incorporated into this Schedule.

Description	Details
Identity of the Controller and Processor	The Parties acknowledge that for the purposes of the Data Protection Legislation, the Customer is the Controller and the Contractor is the Processor in accordance with Clause 14.3.
Subject matter of the processing	No personal data has been identified as requiring to be processed in delivering this service.
Duration of the processing	
Nature and purposes of the processing	
Type of Personal Data being Processed	
Categories of Data Subject	
Plan for return and destruction of the data once the processing is complete UNLESS requirement under union or member state law to preserve that type of data	

APPENDIX A - VARIATION REQUEST FORM

Contract / Project Title: Contract / Project Ref No (FS /FSA No):
Full Description of Variation Request: A full justification and impact assessment including any supplementary evidence must be provided. Any supporting information should be appended to this form.
Area (s) Impacted: - Price ☐ Duration ☐ Price & Duration ☐ Scope of work ☐ Key Personnel ☐ Other ☐
Requester: Signature: Team / Organisation Date:
Supplier Contact Details Supplier Name : Contact Name : Contact Address : : Telephone No : Email Address :
FSA Use Only (Business Area) Amount Approved: Authorised By:- ☐ Cost Centre Manager ☐ Investment Board Signed : Date of Approval: **Please submit this form to** fsa.procurement@food.gov.uk

Procurement Use Only (confirm contract allows for requested variation) Variation Request No: Variation Request Approved by: Date of Approval:
On full approval of this Request for Variation, Procurement will produce a Variation Form for agreement and approval by both parties to append to the Agreement / Contract.

APPENDIX B VARIATION FORM

PROJECT TITLE:

DATE:

VARIATION No:

BETWEEN:

The Food Standards Agency (hereinafter called "the Client") & Ausvet Europe SAS (hereinafter called "the Supplier")

1. The Contract is varied as follows:

Contract x

2. Words and expressions in this Variation shall have the meanings given to them in the Framework.

3. The Contract, including any previous Variations, shall remain effective and unaltered except as amended by this Variation.

SIGNED:

For: The Client	For: The Supplier
By:	By: . . . . .
Full Name:	Full Name: . . . . .
Position:	Title: . . . . .
Date:	Date: . . . . .

APPENDIX C TABLE OF POLICIES

Table of Policies

Policy	Description	Includes:
Acceptable Use of Computers and Networks	The Food Standards Agency provides networks and equipment to its staff to be used as a source of business information which supports the work of the Agency. Inappropriate use of the Agency's networks exposes the Food Standards Agency to risks including virus attacks, compromise of network systems and services, and legal issues. The Acceptable Use Policy sets out the ways in which the network and systems may be used, safeguarding the FSA and its employees against potential legal action and protecting the security of the Agency's IT infrastructure. It is vital in informing the agency's employees of the behaviour expected of them as users of our Information Technology systems.	- Use of Internet and Intranet - Working Remotely - Personal Web Logs and Websites
Data Protection	The Data Protection Act defines UK law on the processing of data about living people. In order to process personal data and sensitive personal data the Food Standards Agency must comply with the Principles of the Act. Failure to comply could result in the Agency or the individual involved having criminal or civil proceedings brought against them. The Food Standards Agency is committed to protecting personal data and as such the Data Protection Policy was created to safeguard the Agency and its employees by informing staff of their responsibilities and rights when handling personal data.	- Processing Personal Data - Sensitive Personal Data - Failure to Comply - Data Subject
Information and Records Management Policy	Food Standards Agency information and records are valuable assets that play a vital role in documenting the policy making and inspection activities of the Agency. Best practice in records management is vital in supporting the Agency to deliver its strategic plan, document business intelligence, demonstrate accountability and protect its interests. The Information and Records Management Policy informs users of their responsibilities when handling information and records and allows the Agency to maintain a framework of standards to maintain compliance with the Public Records Act 1958, Freedom of Information Act and ISO 27001.	- Organisational Records Management Requirements - Records Standards - Registration Records Management process and System Requirements - Technical specification of records - Access to records - Security of records - Preservation of records
Electronic Communications	The Food Standards Agency provides and encourages the use of its Electronic Communication Systems to its employees for the purposes of business communication. This policy has been developed to ensure the Electronic Communications Systems are safeguarded for the efficient exchange of business information within the Food Standards	- Electronic Mail (Email) - Personal Use - Use of Instant Messaging

	Agency and to ensure that all employees are made aware of their responsibilities and adhere to the relevant legislations.	
Users ICT Security Policy (for all staff)	Security is required to counter threats from external penetration, internal users and environmental events beyond FSA control. Appropriate measures must be in place to control access, preserve the confidentiality, integrity and availability of data and protect each ICT system. In addition, the Agency must ensure security standards are maintained to satisfy the requirements of legislation, the HMG Security Policy Framework and industry standards such as ISO27001. This policy defines the FSA security principles and measures to ensure employees understand their responsibilities, managers can identify what is expected of staff and auditors can ascertain that the correct measures are being applied.	- Passwords -Mobile Computing and Remote Access -Virtual Private Networks - Secure Data Storage -Data Backup and Recovery -Workstation Security -Encryption -Software Movements - Security of Equipment Off-Premises -Removal of Property -Secure Equipment Storage and Access
ICT Security Policy (for IT staff ONLY)	This policy is for ISTED staff only The purpose of the policy is as above but with greater detail and extended content in recognition of the increased system access ISTED staff require, and to ensure standards in the development/support/maintenance of our systems are met. It was recognised that detailing the principles that apply to both users and ISTED staff within one length security policy confused the key issues and areas of responsibility and alienated the user audience.	-Mobile Computing and Remote Access -Passwords -Network Security - Perimeter Management -Secure Data Storage -Data Backup and Recovery -Encryption -Agency Software -Software Rollout - Software & Hardware Disposal - Software Movements -Software Audit -Patch Management - Equipment Security -Supporting Utilities -Cabling Security - Equipment Maintenance -Security of Equipment Off-Premises -Removal of Property -Secure Equipment Storage and Access -ICT Systems Security -Control of Development Environments -Change Control - Design and Acceptance of Development -Contingency Planning -Technical Compliance Checking -Technical Review of Operating System Changes
Mobile Voice and Data Policy	The FSA did not have policy for the supply of mobile voice and data tools for Agency staff e.g. Laptops and Blackberries. A policy was needed to allow potential suppliers to give an accurate quote for services, driving better value for money for the FSA. The policy was developed to maximise the efficiency of the mobile voice and data contracts by ensuring that the right people have the right equipment to fulfil their roles. The policy sets out criteria by which these tools are issued together with a principle that each user will be issued with only one mobile data contract.	-Definition of FSA Remote working tools -Connectivity options - Computer Equipment -Who is eligible -Roles & responsibilities