Identification of hazards in meat products manufactured from cultured animal cells: review methodology

2.1 Search protocol

The report followed a scoping literature review methodology. It commenced by generating a search string through a trial-and-error process that comprised of a variety of epithets for cultured meat. These epithets were concatenated together with Boolean operators to complete a Boolean based search for papers using phrases like "Cultured meat" or "Synthetic Meat", whilst using NOT operators to screen out papers that focused on ethics, perceptions and attitudes. The generated search string was then searched in databases listed in section 2.2, to return results related to the topic.

The aim was to keep the search string as identical as possible across all the databases for consistency. However, slight modifications were made to the search string in each database to account for the differences of the respective databases. No screening was applied when completing the searching, and no filters were applied, so all studies were collected for the full time-range. The result from the databases were collected as CSV files and transposed into Microsoft excel for pooling and screening.

The first round of screening occurred by removing all the duplicate titles that were found across the different databases. The Second round of screening occurred by generating eligibly criteria and screening the remaining titles of the papers against this criterion. The criteria contained a list of include words and exclude words. The third round of screening used the judgement of the author by reading the abstracts to only include papers that discussed cultured meat as a technology.

This took the total return of papers from 1348 to a final pool of 154 papers. Due to the low number of final papers, individual papers were not screened, and all papers were read for formulation of the review. Finally, the paper underwent an internal peer review before final editing and publishing. In this process, no metanalysis was conducted, no protocol registration occurred, and all work took place internally within the FSA.

2.2 Databases

Five databases were selected to perform the search:

- EBSCOhost
- Scopus
- Science Direct
- Springer Link
- ProQuest

- PubMed

2.3 Eligibility criteria

The papers selected focused on the technology used to produce cultured meat (e.g. cell lines, production process, scaffolds) and the potential regulatory risks to the consumer (e.g. product composition, toxicology, regulations, specifications). Papers excluded comprised of those that focussed on the media perception, ethics, attitudes, medical research, tabloid, journalism, sociological aspects, and those that did not pertain to cultured meat. For the abstract screening step, papers were screened at the authors discretion to identify papers that considered the technology of cultured meat or potential risks and implications of using this technology.

2.4 Search string development

The generation of the search string followed a trial-and-error process. It commenced by completing initial reading on the topic to gather a list of different names, concepts and ideas that described cultured meat. Subsequently, a list of the stages involved in the development of cultured meat and the associated words was compiled, then different combinations of the terms and Boolean operators were combined and searched on PubMed to identify if useful results were being returned. Through an iterative process the search string was refined to its final formulation. The final search strings are found in Table 1 below.

Table one: final search strings

Database	Search string	Results
Database used: Scopus	("Cultured Meat" OR "In vitro Meat" OR "Clean Meat" OR "Synthetic Meat" OR "Cultured beef" OR "Artificial Meat" OR "In Vitro Meat Production System" OR "Stem Cell Meat") ANDNOT Ethics ANDNOT Perceptions ANDNOT attitudes	192 returns
Databased used: Science Direct	("Cultured Meat" OR "In vitro Meat" OR "Clean Meat" OR "Synthetic Meat" OR "Cultured beef" OR "Artificial Meat" OR "In Vitro Meat Production System" OR "Stem Cell Meat") NOT Ethics NOT Perceptions NOT attitudes	396 returns
Data base used: PubMed	("Cultured Meat" OR "In vitro Meat" OR "Clean Meat" OR "Synthetic Meat" OR "Cultured beef") NOT Ethics NOT Perceptions NOT attitudes	49 returns
Databased used: EBSCOhost	"Cultured Meat" OR "In vitro Meat" OR "Clean Meat" OR "Synthetic Meat" OR "Cultured beef" OR "Artificial Meat" OR "In Vitro Meat Production System" OR "Stem Cell Meat" NOT Ethics NOT Perceptions NOT attitudes	117 returns
Database used: Springer Link	"Cultured Meat" OR "In vitro Meat" OR "Clean Meat" OR "Synthetic Meat" OR "Cultured Beef" OR "In Vitro Meat Production System" OR "Stem Cell Meat" NOT Ethics NOT Perceptions NOT attitudes	163 returns
Database used: ProQuest	"Cultured Meat" OR "In vitro Meat" OR "Clean Meat" OR "Synthetic Meat" OR "Cultured Beef" OR "In Vitro Meat Production System" OR "Stem Cell Meat" NOT Ethics NOT Perceptions NOT attitudes	431 returns