

Additional File 1. Table S1, Table S2 and Figure S1, describing the literature search criteria and the flow diagram of study selection.

TableS1. Common keywords

Operator	Database	Field	Keywords
	<i>Pubmed</i>	<i>All Fields</i>	biomarker* OR marker* OR metabolite* OR biokinetics OR biotransformation OR biomonit*#
	<i>Web of Science</i>	<i>Topic</i>	
	<i>Scopus</i>	<i>Article Title/ Abstract/ Keywords</i>	
AND	<i>Pubmed</i>	<i>All Fields</i>	trial OR experiment OR study OR intervention OR cohort [¥]
	<i>Web of Science</i>	<i>Topic</i>	
	<i>Scopus</i>	<i>Article Title/ Abstract/ Keywords</i>	
AND	<i>Pubmed</i>	<i>All Fields</i>	human* OR men OR women OR patient* OR volunteer* OR participant* OR individuals [§] OR subjects [¥]
	<i>Web of Science</i>	<i>Topic</i>	
	<i>Scopus</i>	<i>Article Title/ Abstract/ Keywords</i>	
AND	<i>Pubmed</i>	<i>All Fields</i>	urine OR plasma OR serum OR blood OR excretion OR hair [¥] OR toenail [¥]
	<i>Web of Science</i>	<i>Topic</i>	
	<i>Scopus</i>	<i>Article Title/ Abstract/ Keywords</i>	
AND	<i>Pubmed</i>	<i>All Fields</i>	intake OR meal OR diet OR ingestion OR consumption OR eating OR drink* OR administration
	<i>Web of Science</i>	<i>Topic</i>	
	<i>Scopus</i>	<i>Article Title/ Abstract/ Keywords</i>	

* wildcard; [¥] only for the category “meat in general” and “fish contaminants”; [§] only for the category “meat in general” ; # only for the categories “fried and processed meat”.

TableS2. Specific keywords for each food group

Fresh meat			
Overall meat intake			
Operator	Database	Field	Keywords
AND	<i>Web of Science</i>	<i>Topic</i>	“Meat”
	<i>Scopus</i>	<i>Article Title/ Abstract/ Keywords</i>	
Red meat			
Operator	Database	Field	Keywords
AND	<i>Pubmed</i>	<i>All Fields</i>	“Red meat” OR “Dark meat” OR “Bush meat” OR “Wild Meat” OR Beef OR Pork OR “Horse meat” OR Mutton OR Goat OR Veal OR Lamb OR Venison OR “Wild boar” OR whale.
	<i>Web of Science</i>	<i>Topic</i>	
	<i>Scopus</i>	<i>Article Title/ Abstract/ Keywords</i>	

White meat			
Operator	Database	Field	Keywords
AND	<i>Pubmed</i>	<i>All Fields</i>	White meat OR Light meat OR Poultry OR Chicken OR “Turkey meat” OR Duck OR Goose OR “Game meat” OR Quail OR Pigeon OR Pheasant OR “Guinea fowl” OR Rabbit
	<i>Web of Science</i>	<i>Topic</i>	
	<i>Scopus</i>	<i>Article Title/ Abstract/ Keywords</i>	
NOT	<i>Pubmed</i>	<i>All Fields</i>	antioxidant* OR disease* OR health OR weight status OR oxidative stress OR toxin* OR carcinogen* OR allergen* OR carbon OR nitrogen OR inflammation OR environmental OR Antibody OR drug* OR pharmacokinetic* OR inhibitor* OR toxicity OR pesticide* OR cancer* OR treatment* OR pathogen* OR carcinoma OR ELISA
	<i>Web of Science</i>	<i>Topic</i>	
	<i>Scopus</i>	<i>Article Title/ Abstract/ Keywords</i>	
Fish and Fish oil			
Operator	Database	Field	Keywords
AND	<i>Pubmed</i>	<i>All Fields</i>	fish OR salmon OR herring OR trout OR perch OR pike OR pikeperch OR zander OR vendace OR cod OR haddock OR plaice OR shark OR hake OR mackerel OR anchovy OR sardine OR tuna OR swordfish OR seabream OR seabass OR eel OR chub OR barbel OR carp OR roach OR bluefish OR catfish OR mullet OR sole OR croaker OR flounder OR porgie OR whiting
	<i>Web of Science</i>	<i>Topic</i>	
	<i>Scopus</i>	<i>Article Title/ Abstract/ Keywords</i>	
NOT	<i>Pubmed</i>	<i>All Fields</i>	"polychlorinated biphenyls" OR organochlorine OR pesticides OR contaminant* OR pollutant* OR lead OR plumb* OR cadmium OR *brominated OR insecticide OR pesticide* OR herbicide* OR fungicide* OR toxin* OR neurotoxicant OR Perfluoroalkyl OR polycyclic aromatic hydrocarbons OR PAHs OR manganese OR selenium OR zinc OR copper OR Arsenic OR arseno* OR arsenate OR arsenite OR arsenate OR arsinic OR mercury OR Methylmercury OR methyl-mercury
	<i>Web of Science</i>	<i>Topic</i>	
	<i>Scopus</i>	<i>Article Title/ Abstract/ Keywords</i>	
NOT	<i>Pubmed</i>	<i>All Fields</i>	allergy OR allergic OR allergenic OR thyroid OR colitis
	<i>Web of Science</i>	<i>Topic</i>	
	<i>Scopus</i>	<i>Article Title/ Abstract/ Keywords</i>	
NOT	<i>Pubmed</i>	<i>All Fields</i>	rat OR rats OR mice OR mouse OR dog OR dogs OR rabbit OR rabbits OR monkey OR monkeys OR pig OR pigs OR piglet OR piglets OR buffalo OR buffaloes OR pigeon OR pigeons
	<i>Web of Science</i>	<i>Topic</i>	
	<i>Scopus</i>	<i>Article Title/ Abstract/ Keywords</i>	

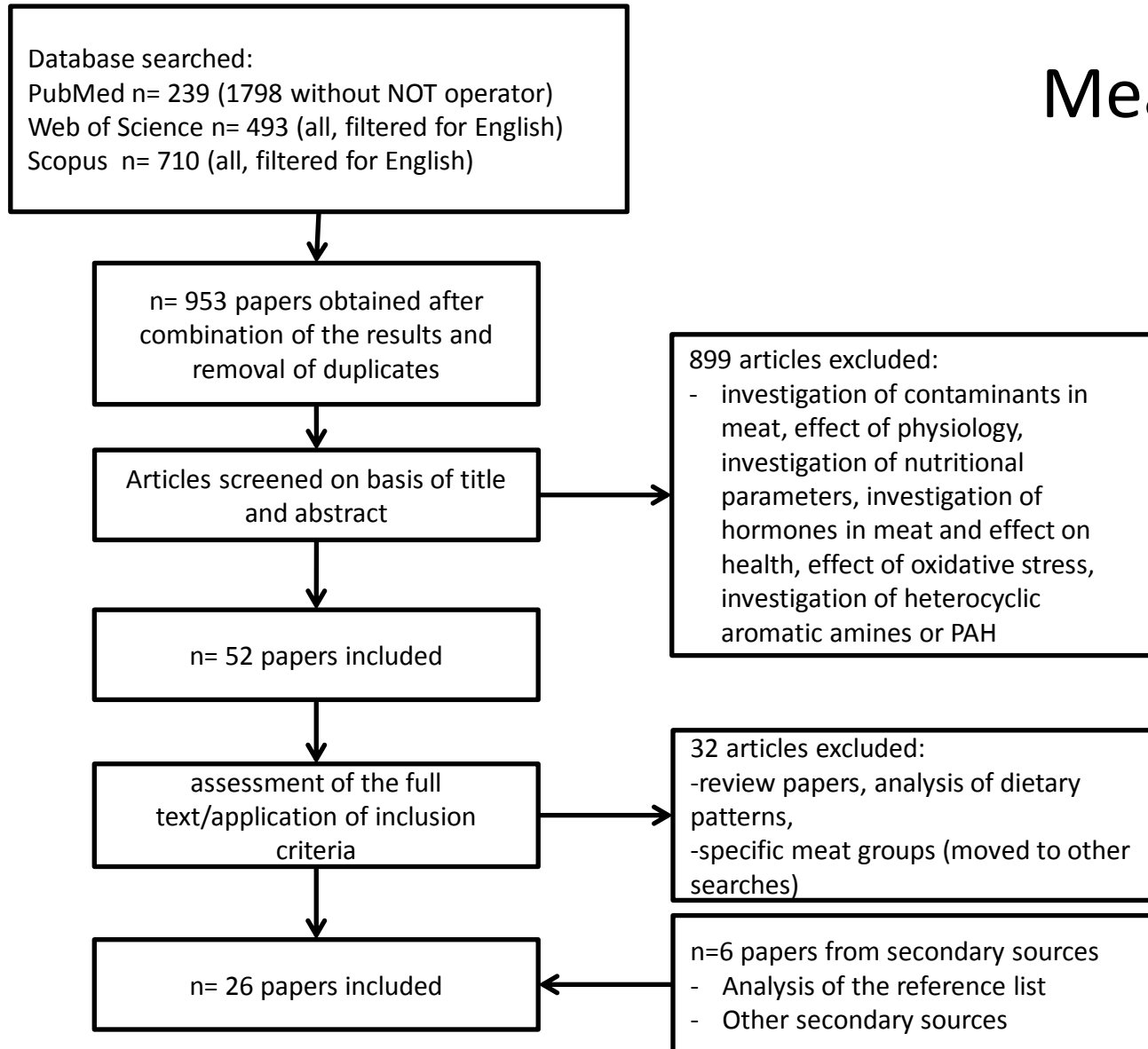
Fish contaminants			
Operator	Database	Field	Keywords
AND	<i>Web of Science</i>	<i>Topic</i>	fish OR seafood OR shellfish OR mollusks OR crustaceans OR "marine food" OR sole OR mussels
	<i>Scopus</i>	<i>Article Title/ Abstract/ Keywords</i>	
AND	<i>Web of Science</i>	<i>Topic</i>	Arsenic OR arseno* OR arsenate OR arsenite OR arsenic
	<i>Scopus</i>	<i>Article Title/ Abstract/ Keywords</i>	
NOT	<i>Web of Science</i>	<i>Topic</i>	allergy OR allergic OR allergenic OR thyroid OR colitis
	<i>Scopus</i>	<i>Article Title/ Abstract/ Keywords</i>	
NOT	<i>Web of Science</i>	<i>Topic</i>	rat OR rats OR mice OR mouse OR dog OR dogs OR rabbit OR rabbits OR monkey OR monkeys OR pig OR pigs OR piglet OR piglets OR buffalo OR buffaloes OR pigeon OR pigeons
	<i>Scopus</i>	<i>Article Title/ Abstract/ Keywords</i>	
Other Seafood			
Operator	Database	Field	Keywords
AND	<i>Pubmed</i>	<i>All Fields</i>	seafood OR shellfish OR molluscs OR bivalves OR clams OR oysters OR scallops OR mussels OR cockles OR octopus OR squid OR cuttlefish OR calamari OR crustaceans OR Shrimps OR prawns OR crabs OR lobsters OR Crayfish OR urchin
	<i>Web of Science</i>	<i>Topic</i>	
	<i>Scopus</i>	<i>Article Title/ Abstract/ Keywords</i>	
NOT	<i>Pubmed</i>	<i>All Fields</i>	"polychlorinated biphenyls" OR "organochlorine pesticides" OR lead OR cadmium OR mercury OR Arsenic OR Methylmercury OR *brominated OR insecticide OR pesticide OR toxin* OR neurotoxicant
	<i>Web of Science</i>	<i>Topic</i>	
	<i>Scopus</i>	<i>Article Title/ Abstract/ Keywords</i>	
NOT	<i>Pubmed</i>	<i>All Fields</i>	allergy OR allergic OR allergenic OR "oxidative stress" OR inflammation
Processed and highly heated meat			
Processed meat			
Operator	Database	Field	Keywords
AND	<i>Pubmed</i>	<i>All Fields</i>	(salted OR cured OR smoked OR canned OR corned OR dried) AND (beef OR pork OR lamb OR chicken OR turkey OR horse OR mutton OR veal OR meat) OR (ham OR bacon OR sausage OR patty OR salami OR jerky OR "hot dog" OR hotdog OR "meat loaf" OR "cold cut" OR "lunch meat" OR "luncheon

			meat")
	<i>Web of Science</i>	<i>Topic</i>	(salted OR cured OR smoked OR canned OR corned OR dried) AND (beef OR pork OR lamb OR chicken OR turkey OR horse OR mutton OR veal OR meat)) OR (ham OR bacon OR sausage OR patt* OR salam* OR jerky OR "hot dog" OR hotdog OR "meat loaf" OR "cold cut" OR "lunch meat*" OR "luncheon meat*")
Heated meat			
Operator	Database	Field	Keywords
AND	<i>Pubmed</i>	<i>All Fields</i>	"done meat" OR heated OR roasted OR broiled OR grilled OR fried OR cooked OR "high temperature" OR baked OR Maillard OR Strecker OR "advanced glycation end products" OR "Polycyclic aromatic hydrocarbons" OR "heterocyclic amines" OR "advanced lipid peroxidation end products" OR "advanced glycation end products"
	<i>Web of Science</i>	<i>Topic</i>	"done meat" OR heated OR roasted OR broiled OR grilled OR fried OR cooked OR "high temperature" OR baked OR Maillard OR Stecker OR "advanced glycation end product*" OR "Polycyclic aromatic hydrocarbon*" OR "heterocyclic amine*" OR "Advanced lipid peroxidation end product*" OR "advanced glycation end products"
	<i>Scopus</i>	<i>Article Title/ Abstract/ Keywords</i>	
Offal meat and other organs			
Operator	Database	Field	Keywords
AND	<i>Pubmed</i>	<i>All Fields</i>	"organ meat" OR "variety meat" OR offal OR "foie gras" OR chitterling OR chitlin OR gizzard OR haggis OR tripe OR maws OR "chicken gizzard" OR "prairie oyster" OR kishka OR faggot OR "blood sausage" OR "black pudding" OR "black sausage" OR sweetbread OR "lamb fries" OR "calf fries" OR "rocky mountain oyster" OR pâté OR trotter OR brawn OR liver OR kidney OR spleen OR udder OR intestine OR heart OR lung OR bladder OR stomach OR cheek OR tongue OR thymus OR "parotid gland" OR "sublingual gland*" OR pancreas OR testicle OR brain OR head OR snout OR eyes OR ears OR lips

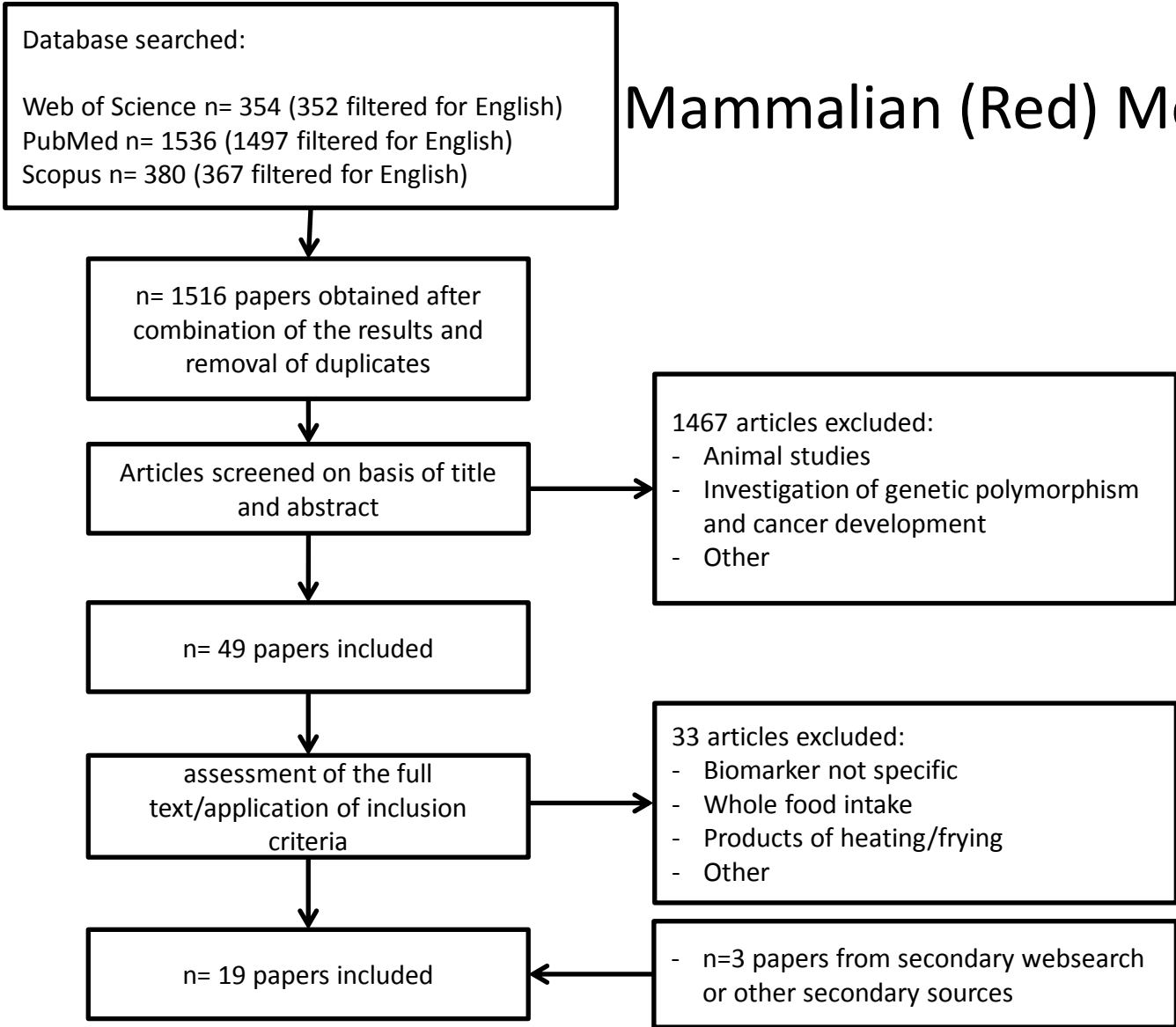
	<i>Web of Science</i>	<i>Topic</i>	“organ meat” OR “variety meat” OR offal OR “foie gras” OR chitterling* OR chitlin* OR gizzard OR haggis OR tripe OR maws OR “chicken gizzard” OR “prairie oyster” OR kishka OR faggot OR “blood sausage” OR “black pudding” OR “black sausage” OR sweetbread OR “lamb fries” OR “calf fries” OR “rocky mountain oyster” OR Pâté OR trotter* OR brawn OR liver OR kidney OR spleen OR udder OR intestine OR heart OR lung OR bladder OR stomach OR cheek OR tongue OR thymus OR “parotid gland*” OR “sublingual gland*” OR pancreas OR testicle* OR brain OR head OR snout OR eyes OR ears OR lips
NOT	<i>Pubmed</i>	<i>All Fields</i>	disease OR tumor OR tumour OR carcinoma OR treatment OR drug OR damage OR syndrome OR dose OR failure OR diagnosis OR symptom OR “blood pressure” OR “blood cell” OR “blood flow” OR dysfunction OR injury OR disorder OR hepatic OR renal OR cerebrospinal OR gastric OR myocard OR newborn OR child OR fetal OR pregnant OR cancer OR risk OR contaminant OR alcohol OR diabetes OR Colon OR plant OR exercise OR smoking OR coffee OR tea OR medicine OR stress OR bone OR gut OR fruit OR juice OR inflammation OR erythrocyte
	<i>Web of Science</i>	<i>Topic</i>	disease OR tumor OR tumour OR carcinoma OR treatment OR drug* OR damage OR syndrome OR dose OR failure OR diagnos* OR symptom* OR “blood pressure” OR “blood cell*” OR “blood flow” OR dysfunction OR injury OR disorder OR hepatic* OR renal OR cerebrospinal OR gastric OR myocard* OR newborn OR child OR fetal OR pregnan* OR cancer OR risk OR contaminant OR alcohol OR diabetes OR Colon* OR plant* OR exercise OR smoking OR coffee OR tea OR medicine OR stress OR bone OR gut OR fruit* OR juice OR inflammation OR erythrocyt*

Figure S1. Flow diagram of study selections describing each individual food group

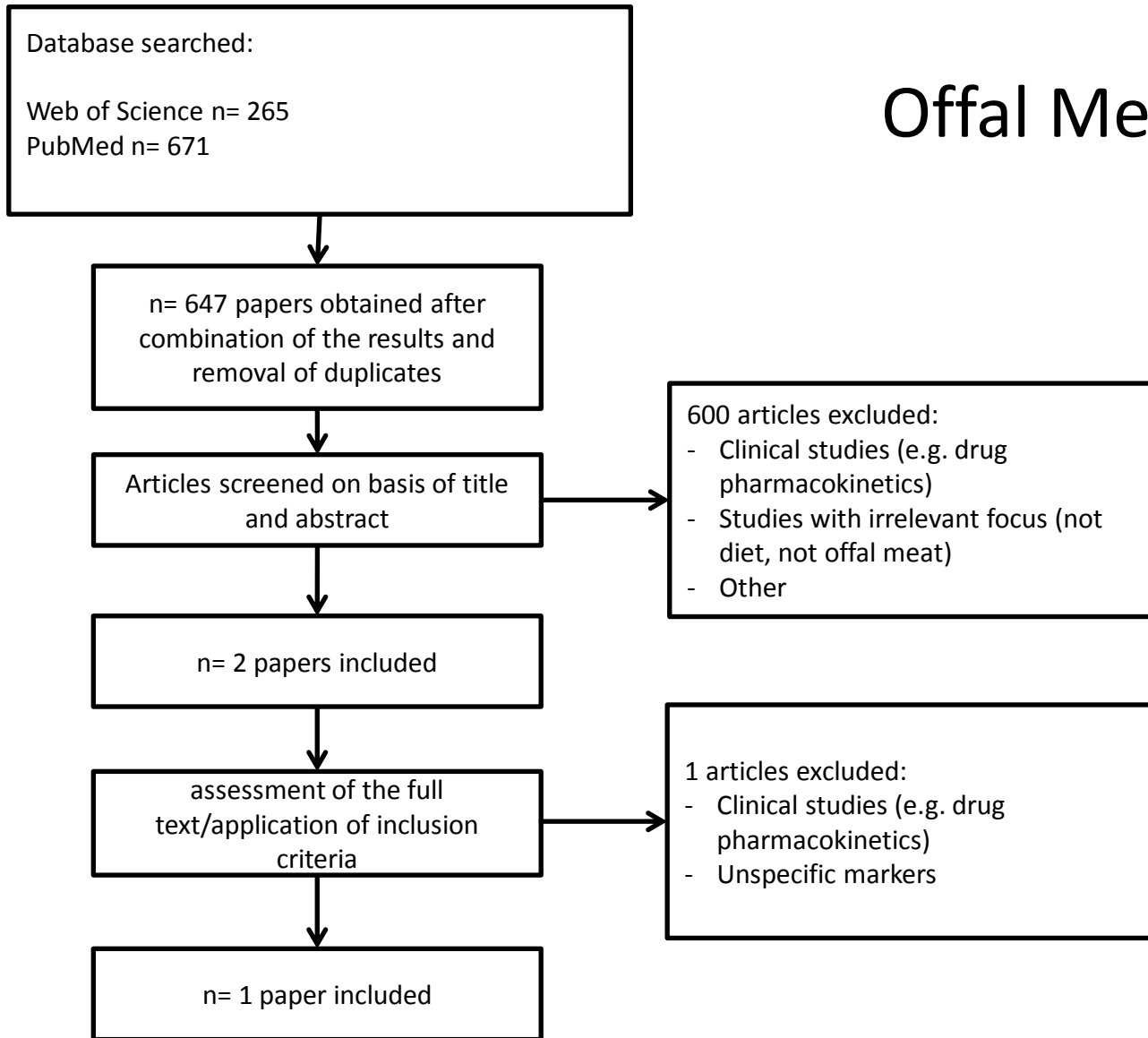
Meat Biomarkers



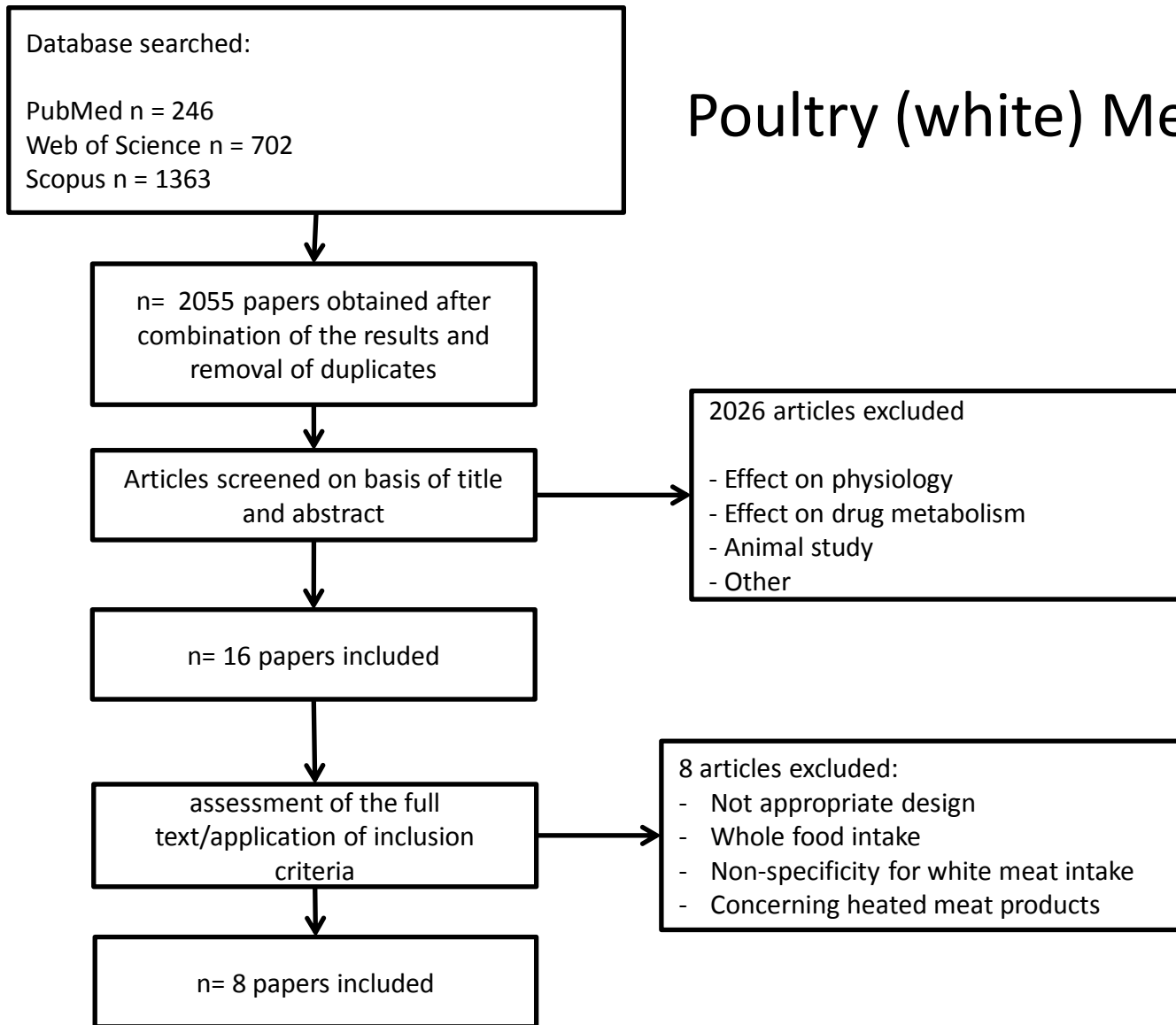
Mammalian (Red) Meat Biomarkers



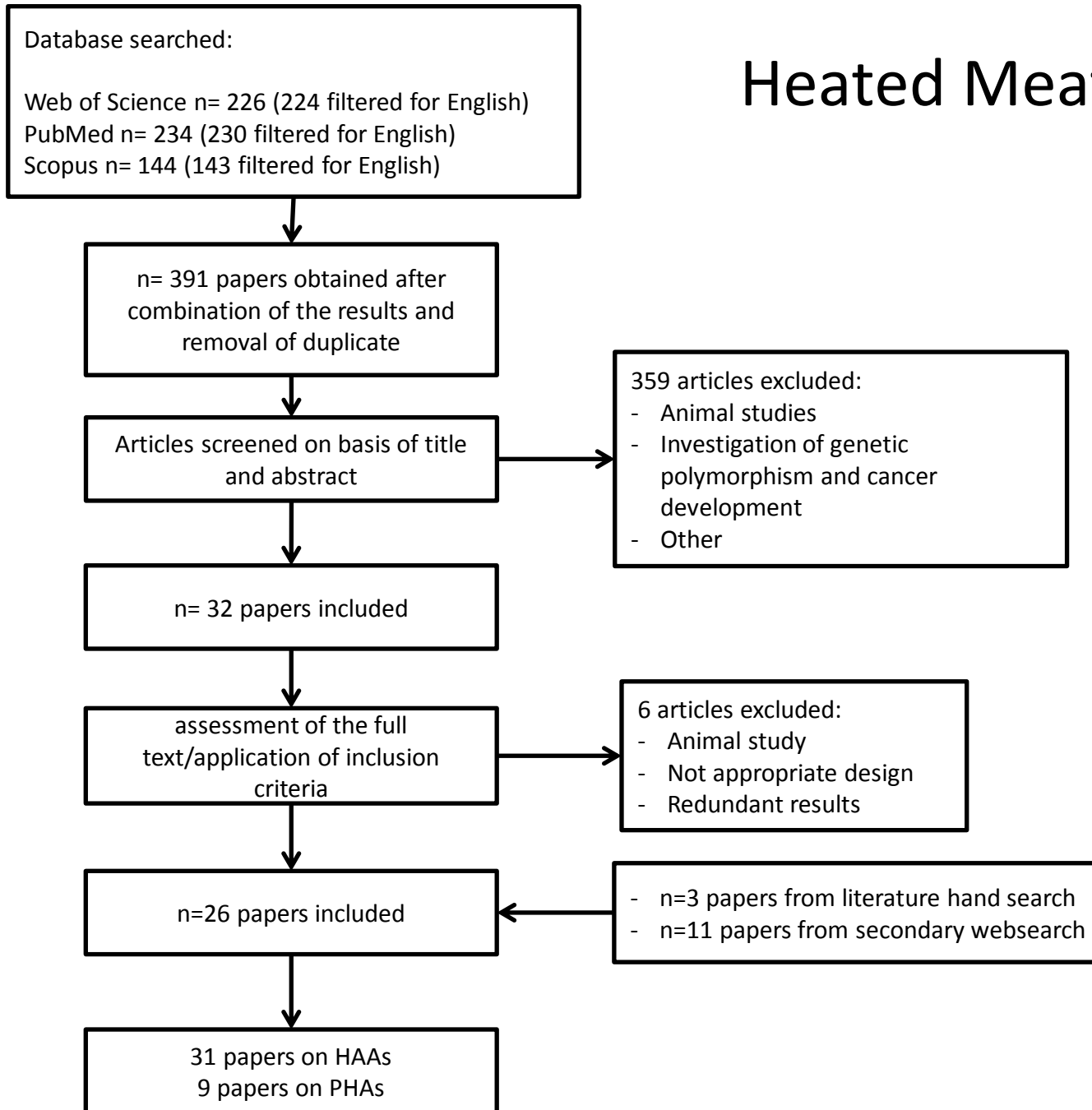
Offal Meat Biomarkers



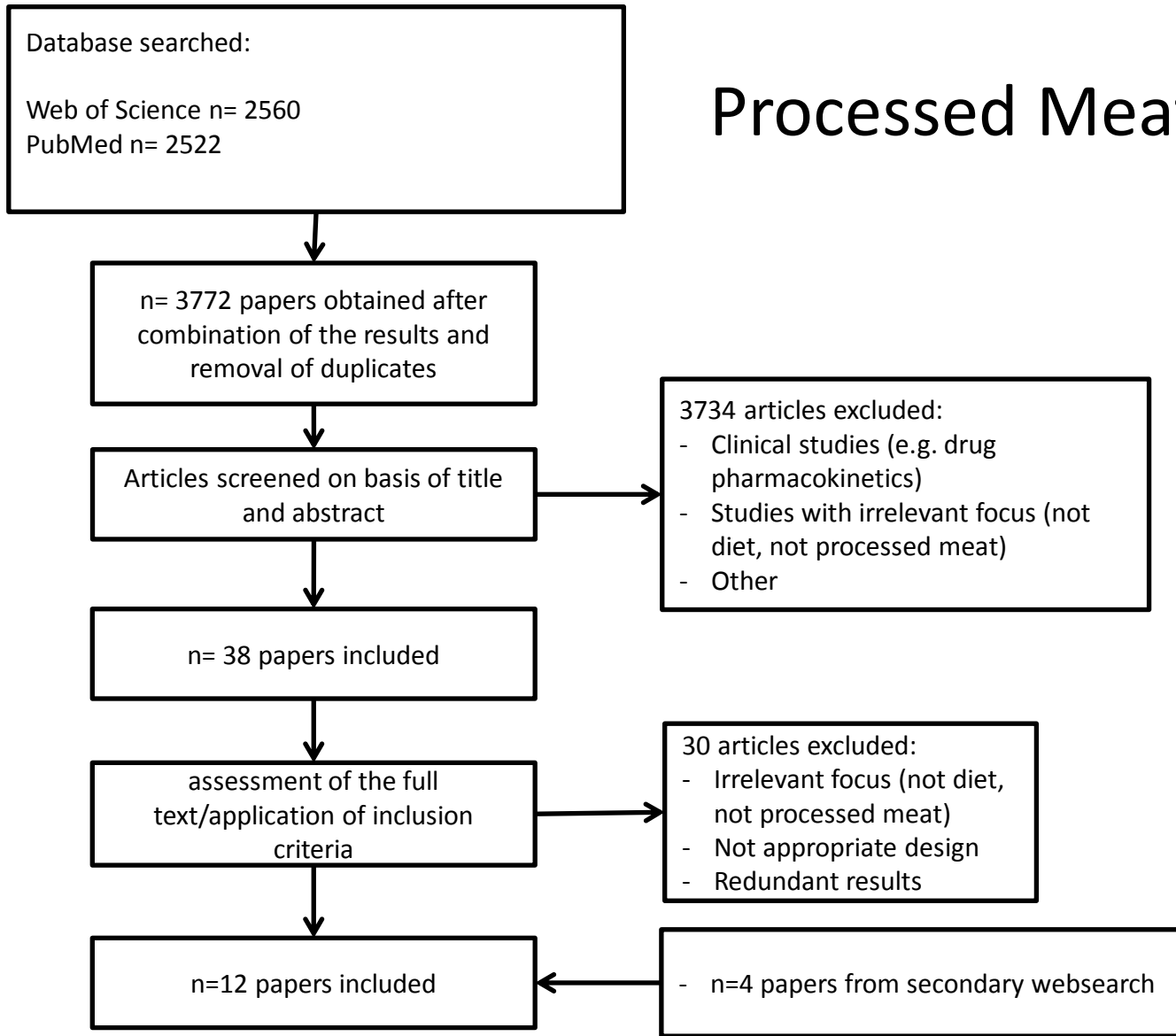
Poultry (white) Meat Biomarkers



Heated Meat Biomarkers



Processed Meat Biomarkers



Fish and fish oil Biomarkers

Database searched:

PubMed n= 185

Web of Science n = 1157

Scopus n = 691

n= 1340 papers obtained after
combination of the results and
removal of duplicates

Articles screened on basis of title and
abstract

1115 articles excluded

- Effects on physiology, bone health and calcium metabolism, macular degeneration
- Effects on drug metabolism
- Fish studies
- Other purposes

n= 225 papers included

assessment of the full
text/application of inclusion criteria

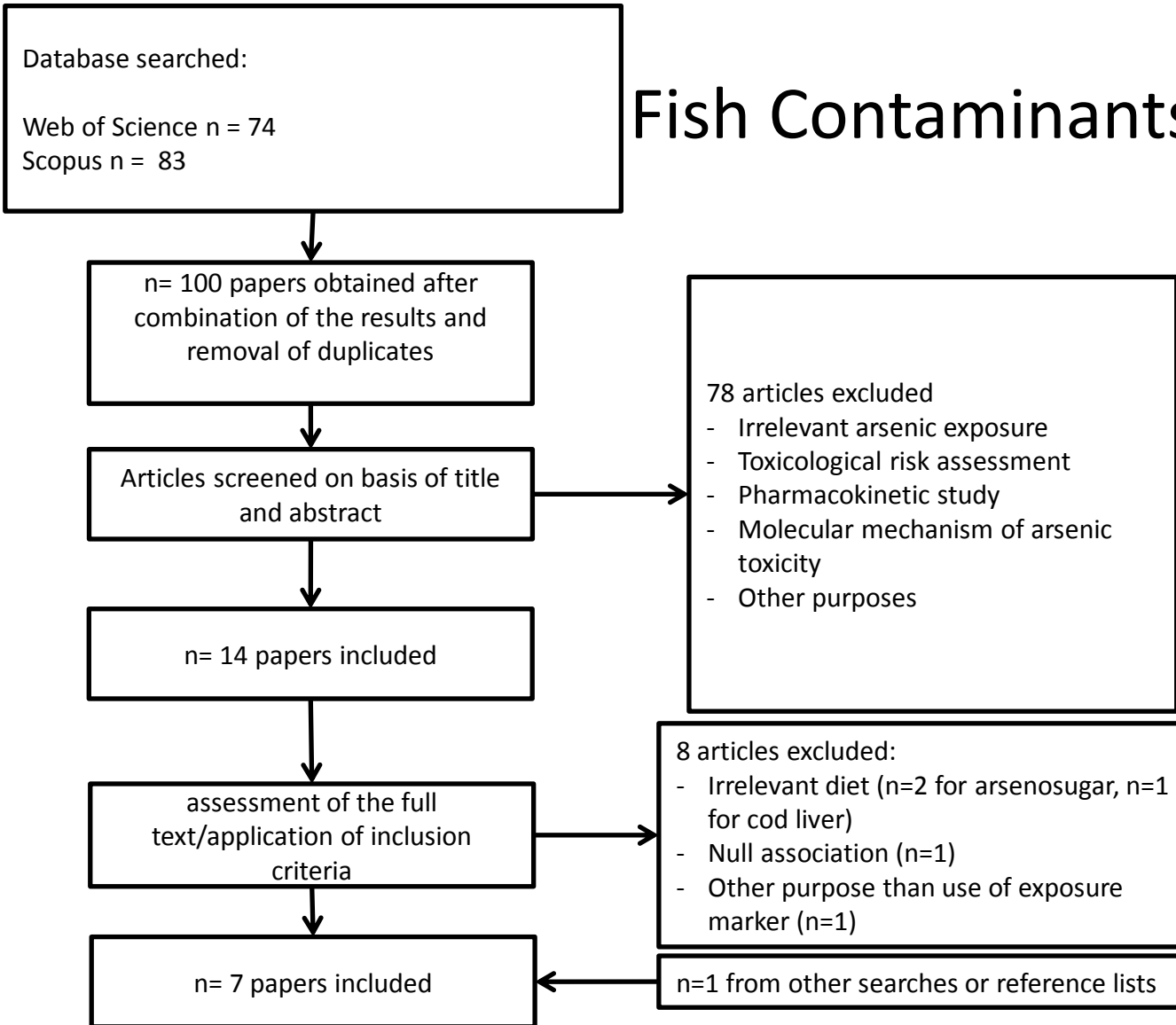
170 articles excluded:

- Irrelevant diet (pure n-3 fatty acids, arachidonic acids, cod protein, seal)
- Irrelevant outcomes (effects on cholesterol levels, 1-carbon metabolism, immunology, fatty acids levels in breast milk, neurological development of newborns, urinary iodine excretion)
- Poorly reported methodology or inappropriate study designs for food intake biomarkers (BFIs) discovery
- Proteomics study (n=1)
- Unavailable links (n=4)

n= 74 papers included

19 paper from reference lists and from other searches on meat

Fish Contaminants Biomarkers



Other Seafood Biomarkers

