Composition differences between organic and conventional meat; a systematic literature review and meta-analysis

SUPPLEMENTARY DATA

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1. LITERATURE REVIEW

Supplementary Tables S1 to S7 and Supplementary Figures S1 to S2 provide detailed information on the comparison studies, types of data extracted, data sources and characteristics.

Table S1. List of comparison studies included in the meta-analysis.

ID	Reference	SA*
105	Angood KM, Wood JD, Nute GR et al. (2008) A comparison of organic and conventionally-produced lamb purchased from three major UK supermarkets: Price, eating quality and fatty acid composition. Meat Science 78, 176-184.	+
578	Barbieri G, Macchiavelli L & Rivaldi P (2008) Protein quality and content of nitrite, nitrate and metals in commercial samples of organic and conventional cold meats. In Proceedings of the 2nd Conference of the International Society of Organic Agriculture Research ISOFAR, Modena, Italy, June 18-20, 2008: Cultivating the Future Based on Science.	
658	Bjorklund EA, Heins BJ, DiCostanzo A et al. (2014) Fatty acid profiles, meat quality, and sensory attributes of organic versus conventional dairy beef steers. Journal of Dairy Science 97, 1828-1834.	+
485	Blanco-Penedo I, Lopez-Alonso M, Miranda M et al. (2010) Non-essential and essential trace element concentrations in meat from cattle reared under organic, intensive or conventional production systems. Food Additives & Contaminants, Part A: Chemistry, Analysis, Control 27, 36-42.	+
469	Blanco-Penedo I, Shore RF, Miranda M et al. (2009) Factors affecting trace element status in calves in NW Spain. Livestock Science 123, 198-208.	+
568	Brown SN, Nute GR, Baker A et al. (2008) Aspects of meat and eating quality of broiler chickens reared under standard, maize-fed, free-range or organic systems. British Poultry Science 49, 118-124.	
159	Castellini C, Mugnai C & Dal Bosco A (2002) Effect of organic production system on broiler carcass and meat quality. Meat Science 60, 219-225.	+
646	Cozzi G, Preciso SF, Gottardo F et al. (2001) Organic rearing as an alternative to intensive beef production systems. L'Informatore Agrario 57, 101-107.	+
645	de la Torre CA, Conte Junior CA, da Cruz Silva Canto ACV et al. (2012) Biochemical changes in alternative poultry meat during refrigerated storage. Revista Brasileira de Ciencia Veterinaria 19, 195-200.	+
633	de-la-Vega F, Guzman JL, Delgado-Pertinez M et al. (2013) Fatty acid composition of muscle and adipose tissues of organic and conventional Blanca Andaluza suckling kids. Spanish Journal of Agricultural Research 11, 770-779.	+
634	de-la-Vega F, Guzman JL, Delgado-Pertinez M et al. (2013) Fatty acid composition of muscle and internal fat depots of organic and conventional Payoya goat kids. Spanish Journal of Agricultural Research 11, 759-769.	+
529	dos Santos Pinho AP, Jardim Barcellos JO, Peripolli V et al. (2011) Lipid profile of intramuscular fat in meat cattle cuts of commercial brands. Revista Brasileira de Zootecnia 40, 1134-1142.	+
466	Esterhuizen J, Groenewald IB, Strydom PE et al. (2008) The performance and meat quality of Bonsmara steers raised in a feedlot, on conventional pastures or on organic pastures. South African Journal of Animal Science 38, 303-314.	+
661	Feng C, Yang S, Shiu J et al. (2011) Effects of organic ration on the carcass characteristics and meat quality of castrated Taiwan native black goat. Journal of Taiwan Livestock Research 44, 213-224.	
647	Fischer K (2002) Does the feeding of an organic diet to pigs result in better pork quality? Forschungs-Report 1, 20-23.	

ID, Paper unique identification number. *Papers included in standard meta-analysis: +.

Table S1 cont. List of comparison studies included in the meta-analysis.

ID	Reference	SA*
657	Garcia-Torres S, Curbelo P, Osorio C et al. (2011) Effect of organic and conventional systems on lipid composition of Longissimus dorsi of beef cattle. In Proceedings of the XIV Jordanas Sobre Produccion Animal, Zaragoza, Spain, May 17-18, 2011., pp. 592-594. Spain.	+
235	Ghidini S, Zanardi E, Battaglia A et al. (2005) Comparison of contaminant and residue levels in organic and conventional milk and meat products from northern Italy. Food Additives & Contaminants, Part A: Chemistry, Analysis, Control 22, 9-14.	
635	Gibbs RA, Rymer C & Givens DI (2013) Fatty acid composition of cooked chicken meat and chicken meat products as influenced by price range at retail. Food Chemistry 138, 1749-1756.	+
563	Grela ER & Kowalczuk E (2009) Content of nutrients and fatty acid composition in meat and pork-butcher's meat from organic pig production. Zywnosc. Nauka. Technologia. Jakosc. 4, 34-40.	+
167	Hansen LL, Claudi-Magnussen C, Jensen SK et al. (2006) Effect of organic pig production systems on performance and meat quality. Meat Science 74, 605-615.	+
636	Hardy B, Crilly N, Pendleton S et al. (2013) Impact of Rearing Conditions on the Microbiological Quality of Raw Retail Poultry Meat. Journal of Food Science 78, M1232-M1235.	+
564	Hoegberg A, Pickova J, Andersson K et al. (2003) Fatty acid composition and tocopherol content of muscle in pigs fed organic and conventional feed with different n6/n3 ratios, respectively. Food Chemistry 80, 177-186.	+
199	Husak RL, Sebranek JG & Bregendahl K (2008) A survey of commercially available broilers marketed as organic, free-range, and conventional broilers for cooked meat yields, meat composition, and relative value. Poultry Science 87, 2367-2376.	+
135	Jahan K & Paterson A (2007) Lipid composition of retailed organic, free-range and coventional chicken breasts. International Journal of Food Science and Technology 42, 251-262.	+
138	Jahan K, Paterson A & Spickett CM (2004) Fatty acid composition, antioxidants and lipid oxidation in chicken breasts from different production regimes. International Journal of Food Science and Technology 39, 443-453.	
659	Jahan K, Paterson A, Piggott J et al. (2005) Chemometric modeling to relate antioxidants, neutral lipid fatty acids, and flavor components in chicken breasts. Poultry Science 84, 158-166.	+
573	Kamihiro S (2011) Meat quality and fatty acid composition of retail organic and non-organic beef in UK. MSc thesis, Newcastle University.	
637	Karwowska M & Dolatowski ZJ (2013) Comparison of lipid and protein oxidation, total iron content and fatty acid profile of conventional and organic pork. International Journal of Food Science and Technology 48, 2200-2206.	+
641	Kim DH, Cho SH, Kim JH et al. (2009) Comparison of the quality of the chicken breasts from organically and conventionally reared chickens. Korean Journal for Food Science of Animal Resources 29, 409-414.	+
200	Kim DH, Seong PN, Cho SH et al. (2009) Fatty acid composition and meat quality traits of organically reared Korean native black pigs. Livestock Science 120, 96-102.	+
648	Kucukylmaz K, Bozkurt M, Catl AU et al. (2012) Chemical composition, fatty acid profile and colour of broiler meat as affected by organic and conventional rearing systems. South African Journal of Animal Science 42, 360-368.	
569	Lawlor JB, Sheehan EM, Delahunty CM et al. (2003) Oxidative stability of cooked chicken breast burgers obtained from organic, free-range and conventionally reared animals. International Journal of Poultry Science 2, 398-403.	+
349	Linden A, Andersson K & Oskarsson A (2001) Cadmium in Organic and Conventional Pig Production. Archives of Environmental Contamination and Toxicology 40, 425-431.	+
604	Lozicki A, Dymnicka M, Arkuszewska E et al. (2012) Effect of pasture or maize silage feeding on the nutritional value of beef. Annals of Animal Science 12, 81-93.	+

ID, Paper unique identification number. *Papers included in standard meta-analysis: +.

Table S1 cont. List of comparison studies included in the meta-analysis.

ID	Reference	SA*
280	Millet S, Hesta M, Seynaeve M et al. (2004) Performance, meat and carcass traits of fattening pigs with organic versus conventional housing and nutrition. Livestock Production Science 87, 109-119.	+
561	Millet S, Raes K, Van den Broeck W et al. (2005) Performance and meat quality of organically versus conventionally fed and housed pigs from weaning till slaughtering. Meat Science 69, 335-341.	+
407	Miotello S (2009) Meat quality of calves obtained from organic and conventional farming. Italian Journal of Animal Science 8, 213-215.	+
560	Morbidini L, Sarti DM, Pollidori P et al. (2001) Carcass, meat and fat quality in Italian Merino derived lambs obtained with 'organic' farming systems. In Proceedings of the Meeting of the Sub-Network on Production Systems of the FAO-CIHEAM Inter-Regional Cooperative Research and Development Network on Sheep and Goats (Rubino R. (ed.), Morand-Fehr P. (ed.)) pp. 29-34.	+
649	Morgante M, Piasentier E, Bonanno A et al. (2007) Effect of the dam's feeding regimen on the meat quality of light suckling lambs. Italian Journal of Animal Science 6, 570-572.	
642	Nachman KE, Baron PA, Raber G et al. (2013) Roxarsone, inorganic arsenic, and other arsenic species in chicken: A U.S.-based market basket sample. Environmental Health Perspectives 121, 818-824.	
567	Nurnberg K, Zupp W, Grumbach S et al. (2006) Does feeding under organic farming conditions affect the meat and fat quality of finishing lambs? Fleischwirtschaft 86, 103-107.	+
397	Olivan M, Sierra V, Castro P et al. (2009) Carcass and meat quality from yearling bulls managed under organic or conventional systems. In Proceedings of the 60th Annual Meeting of the European Federation of Animal Science (EAAP), August 24-27, 2009.	+
197	Olsson IM, Jonsson S & Oskarsson A (2001) Cadmium and zinc in kidney, liver, muscle and mammary tissue from dairy cows in conventional and organic farming. Journal of Environmental Monitoring 3, 531-538.	+
188	Olsson V, Andersson K, Hansson I et al. (2003) Differences in meat quality between organically and conventionally produced pigs. Meat Science 64, 287-297.	+
644	Olsson V, Solyakov A, Skog K et al. (2002) Natural variations of precursors in pig meat affect the yield of heterocyclic amines - Effects of RN genotype, feeding regime, and sex. Journal of Agricultural and Food Chemistry 50, 2962-2969.	+
209	Pla M (2008) A comparison of the carcass traits and meat quality of conventionally and organically produced rabbits. Livestock Science 115, 1-12.	+
355	Pla M, Hernandez P, Arino B et al. (2007) Prediction of fatty acid content in rabbit meat and discrimination between conventional and organic production systems by NIRS methodology. Food Chemistry 100, 165-170.	+
650	Polat U, Oruc HH, Hanoglu H et al. (2009) Comparative evaluation of biochemical components of blood serum and toxicological parameters of kivircik lambs fed on conventional and organic fodder. Pakistan Journal of Zoology 41, 109-115.	+
574	Prache S, Gatellier P, Thomas A et al. (2011) Comparison of meat and carcass quality in organically reared and conventionally reared pasture-fed lambs. Animal 5, 2001-2009.	+
516	Prevolnik M, Ocepek M, Candek-Potokar M et al. (2011) Growth, Carcass and Meat Quality Traits of Pigs Raised under Organic or Conventional Rearing Systems Using Commercially Available Feed Mixtures. Slovenian Veterinary Research 48, 15-26.	+
651	Razminowicz RH, Kreuzer M & Scheeder MRL (2006) Quality of retail beef from two grass-based production systems in comparison with conventional beef. Meat Science 73, 351-361.	
652	Revilla I, Vivar-Quintana AM, Luruena-Martinez MA et al. (2008) Organic vs conventional suckling lamb production: product quality and consumer acceptance. In Proceedings of the 16th IFOAM Organic World Congress, Modena, Italy, June 16-20, 2008.	

ID, Paper unique identification number. *Papers included in standard meta-analysis: +.

Table S1 cont. List of comparison studies included in the meta-analysis.

ID	Reference	SA*
566	Revilla I, Vivar-Quintana AM, Luruena-Martinez MA et al. (2009) Volatile compounds analysis of suckling lamb meat of conventional and organic production systems. In Proceedings of the XXXIX Jornadas de Estudio, XIII Jornadas sobre Produccion Animal, Zaragoza, Spain, May 12-13, 2009, pp. 523-525.	+
268	Ristic M, Freudenreich P, Damme K et al. (2007) Meat quality of broilers: a comparison between conventional and organic production. Fleischwirtschaft 87, 114-116.	
638	Rosenquist H, Boysen L, Krogh AL et al. (2013) Campylobacter contamination and the relative risk of illness from organic broiler meat in comparison with conventional broiler meat. International Journal of Food Microbiology 162, 226-230.	+
654	Sanchez Iglesias MJ, Vaquero Martin M, Rubio Hernando B et al. (2012) Study of the characteristics of conventional cooked hams and organic cooked hams. In Proceedings of the 7th International Symposium on the Mediterranean Pig, Cordoba, Spain, October 14-16, 2010., 101 ed., pp. 483-486 [EJ de Pedro and AB Cabezas, editors].	+
640	Schiavone A, Peiretti PG, Angulo FMA et al. (2013) Effect of rearing system and genotype on performance, carcass characteristics and meat quality of slow growing rabbits. Large Animal Review 19, 83-87.	+
660	Sencic D, Kalic G, Steiner Z et al. (2012) Slaughterhouse quality of chicken from organic and conventional housing system. In Proceedings of the 22nd International Scientific-Expert Conference of Agriculture and Food Industry, Sarajevo, Bosnia and Herzegovina, September 28 - October 1, 2011., pp. 56-58.	
662	Sencic, Samac D, Antunovic Z et al. (2009) Quality of chicken meat from organic and conventional fattening. Meso 11, 110-113.	
562	Smith GC, Heaton KL, Sofos JN et al. (1997) Residues of antibiotics, hormones and pesticides in conventional, natural and organic beef. Journal of Muscle Foods 8, 157-172.	
521	Soysal D, Cibik R, Aydin C et al. (2011) Comparison of conventional and organic management conditions on growth performance, carcass characteristics and haematological parameters in Karacabey Merino and Kivircik breeds. Tropical Animal Health and Production 43, 817-823.	+
570	Urbanczyk J, Hanczakowska E & Swiatkiewicz M (2005) The effect of organic feeding on carcass and meat quality of fattening pigs. Journal of Animal and Feed Sciences 14, 409-412.	
183	Walshe BE, Sheehan EM, Delahunty CM et al. (2006) Composition, sensory and shelf life stability analyses of Longissimus dorsi muscle from steers reared under organic and conventional production systems. Meat Science 73, 319-325.	+
603	Wilches D, Rovira J, Jaime I et al. (2011) Evaluation of the effect of a maternal rearing system on the odour profile of meat from suckling lamb. Meat science 88, 415-423.	+
655	Zeola NMBL, da Silva Sobrinho AG & Manzi GM (2011) Qualitative parameters of lamb meat submitted to organic and conventional production models. Brazilian Journal of Veterinary Research and Animal Science 48, 107-115.	
606	Zeola NMBL, da Silva Sobrinho AG & Manzi GM (2011) Regional and centesimal composition of carcass of lambs raised under conventional and organic production models. Revista Brasileira de Zootecnia 40, 2963-2970.	+
605	Zeola NMBL, da Silva Sobrinho AG, Borba H et al. (2012) Evaluation of the production model and fat inclusion in qualitative and sensorial parameters of the sheep hamburgers. Arquivo Brasileiro De Medicina Veterinaria E Zootecnia 64, 727-734.	

ID, Paper unique identification number. *Papers included in standard meta-analysis: +.

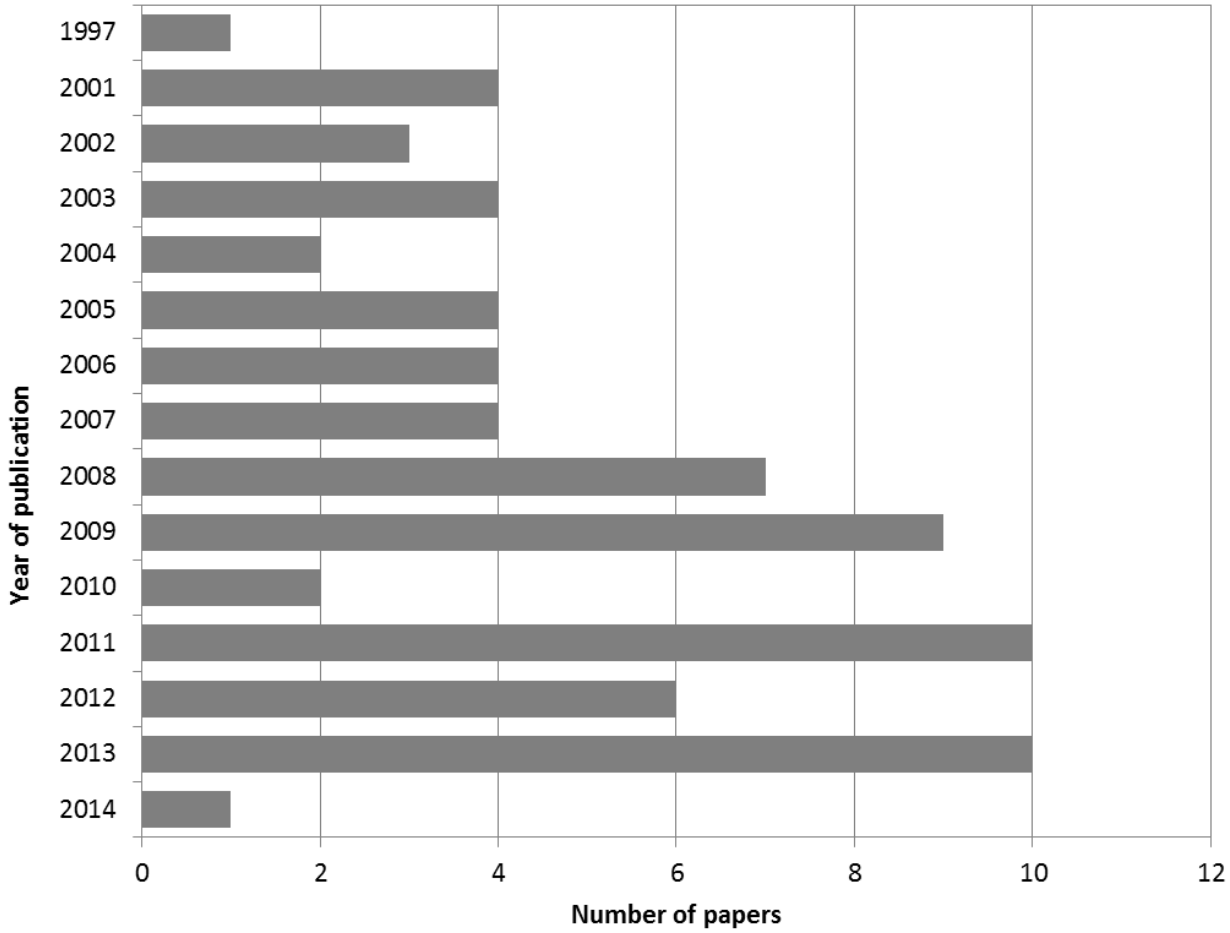


Figure S1. Number of papers included in the meta-analysis by year of publication.

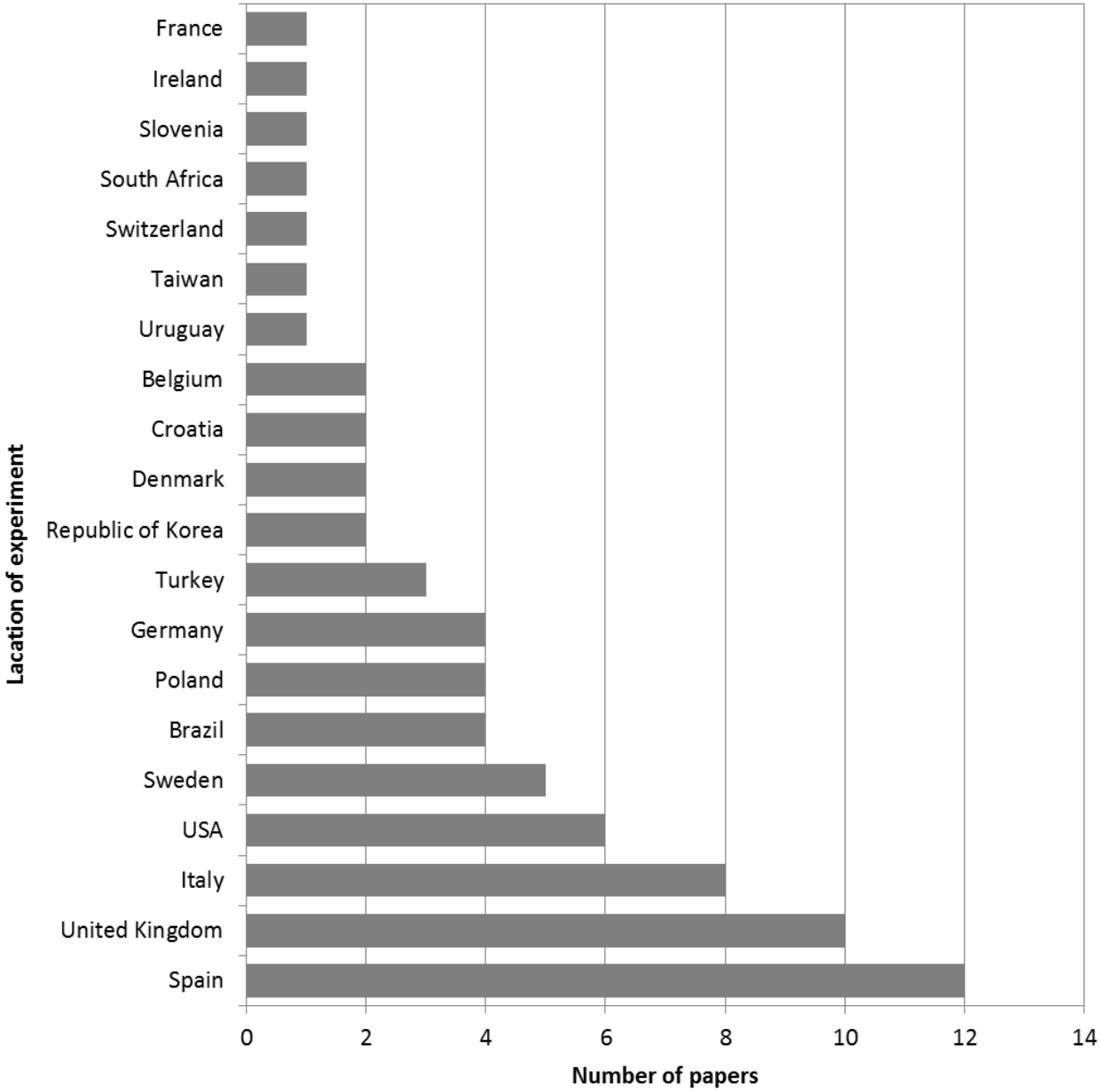


Figure S2. Number of papers included in the meta-analysis by location of the experiment (country).

Table S2. Study type, location, species/product, animal group and fatty acids analysis method information of the comparison studies included in the meta-analysis.

ID	ST	Location	Product*	Animal group	AM
105	BS	United Kingdom	lamb (m. Longissimus lumborum)	Lamb and goat meat	GC
135	BS	United Kingdom	chicken (breast, m. Pectoralis major)	Chicken meat	GC
138	BS	United Kingdom	chicken (breast, m. Pectoralis major)	Chicken meat	GC
159	EX	Italy	chicken (breast, drumstick)	Chicken meat	GC†
			chicken (carcass)	Chicken meat	
167	EX	Denmark	pig (back fat)	Pork	GC
			pig (liver)	Pork	
			pork (carcass)	Pork	
			pork (m. Longissimus dorsi)	Pork	
183	BS	United Kingdom	beef (m. Longissimus dorsi)	Beef	GC
188	EX	Sweden	pork (m. Longissimus dorsi)	Pork	
197	EX	Sweden	beef (forearm)	Beef	
			cattle (kidney, liver)	Beef	
199	BS	USA	chicken (breast, thigh)	Chicken meat	GC
			chicken (breast, thigh, skin) raw	Chicken meat	
200	EX	Republic of Korea	pork (m. Longissimus dorsi)	Pork	GC
209	EX	Spain	rabbit meat (hind leg)	Rabbit meat	NIRS
235	BS	Italy	beef (m. Longissimus dorsi)	Beef	
268	EX	Germany	chicken (breast, thigh)	Chicken meat	
			chicken (carcass)	Chicken meat	
280	EX	Belgium	pork (m. Longissimus dorsi)	Pork	
349	EX	Sweden	pig (kidney, liver)	Pork	
355	EX	Spain	rabbit meat (hind leg)	Rabbit meat	NIRS
397	EX	Spain	beef (meat)	Beef	
407	CF	Italy	beef (8th rib)	Beef	GC†
			beef (m. Longissimus thoracis)	Beef	
466	EX	South Africa	beef (m. Longissimus thoracis)	Beef	
469	CF	Spain	cattle (kidney, liver)	Beef	
485	CF	Spain	beef (diaphragm)	Beef	
516	EX	Slovenia	pork (m. Longissimus dorsi)	Pork	GC

ID, Paper unique identification number (see Table S1 for references); ST, Study type (CF – Comparison of Farms, BS – Basket Study, EX – Controlled Experiment); AM, analytical method of fatty acids assessment (GC – gas chromatography based, NIRS – NIR-spectroscopy calibrated with GC-data). *Information provided by author, considered as separate datapoints; †Studies which provided only brief descriptions of the methods used to assess fatty acids composition.

Table S2 cont. Study type, location, species/product, animal group and fatty acids analysis method information of the comparison studies included in the meta-analysis.

ID	ST	Location	Product*	Animal group	AM
521	EX	Turkey	lamb (m. Longissimus dorsi)	Lamb and goat meat	
529	BS	Uruguay	beef (short loin, rump loin, rib)	Beef	GC
560	EX	Italy	lamb (m. Longissimus dorsi)	Lamb and goat meat	GC†
561	EX	Belgium	pork (m. Longissimus thoracis)	Pork	
562	BS	USA	beef (meat)	Beef	
			cattle (fat)	Beef	
			cattle (kidney, liver)	Beef	
563	EX	Poland	pork (m. Adductor, m. Longissimus dorsi)	Pork	GC
564	EX	Sweden	pork (m. Longissimus dorsi)	Pork	GC
566	EX	Spain	lamb (m. Longissimus dorsi)	Lamb and goat meat	
567	EX	Germany	lamb (m. Longissimus dorsi)	Lamb and goat meat	GC
568	BS	United Kingdom	chicken (breast, m. Pectoralis major)	Chicken meat	
569	BS	United Kingdom	chicken (breast) raw	Chicken meat	GC
570	EX	Poland	pig (back fat)	Pork	GC†
573	BS	United Kingdom	beef (m. Longissimus dorsi)	Beef	GC
574	EX	France	lamb (m. Longissimus thoracis et lumborum)	Lamb and goat meat	GC
578	BS	Italy	cold meat (salami, dry ham, cooked ham)	Not specified	
603	EX	Spain	lamb (m. Longissimus lumborum)	Lamb and goat meat	GC
604	CF	Poland	beef (m. Longissimus thoracis)	Beef	GC
605	EX	Brazil	lamb (hamburger)	Lamb and goat meat	
606	EX	Brazil	lamb (m. Longissimus dorsi)	Lamb and goat meat	GC†
633	EX	Spain	goat meat (m. Longissimus thoracis)	Lamb and goat meat	GC
			goat (pelvic and kidney fat)	Lamb and goat meat	
634	EX	Spain	goat meat (m. Longissimus thoracis)	Lamb and goat meat	
			goat (pelvic and kidney fat)	Lamb and goat meat	
635	BS	United Kingdom	chicken (breast, leg) cooked	Chicken meat	GC
636	BS	USA	chicken (breast) raw	Chicken meat	
			turkey (breast) raw	Turkey meat	
637	BS	Poland	pork (m. Longissimus dorsi)	Pork	GC
638	CF	Denmark	chicken (breast) raw	Chicken meat	

ID, Paper unique identification number (see Table S1 for references); ST, Study type (CF – Comparison of Farms, BS – Basket Study, EX – Controlled Experiment); AM, analytical method of fatty acids assessment (GC – gas chromatography based, NIRS – NIR-spectroscopy calibrated with GC-data). *Information provided by author, considered as separate datapoints; †Studies which provided only brief descriptions of the methods used to assess fatty acids composition.

Table S2 cont. Study type, location, species/product, animal group and fatty acids analysis method information of the comparison studies included in the meta-analysis.

ID	ST	Location	Product*	Animal group	AM
640	EX	Italy	rabbit meat (carcass)	Rabbit meat	GC
			rabbit meat (m. Longissimus lumborum)	Rabbit meat	
641	EX	Republic of Korea	chicken (breast) raw	Chicken meat	GC
642	BS	USA	chicken (breast) cooked	Chicken meat	
644	EX	Sweden	pork (m. Longissimus dorsi) cooked	Pork	
			pork (m. Longissimus dorsi) raw	Pork	
645	BS	Brazil	chicken (breast) raw	Chicken meat	
646	EX	Italy	beef (m. Longissimus thoracis)	Beef	
647	EX	Germany	pork (meat)	Pork	GC
648	EX	Turkey	chicken (breast, thigh)	Chicken meat	GC
649	EX	Italy	lamb (m. Longissimus dorsi)	Lamb and goat meat	GC
650	EX	Turkey	lamb (m. Semitendinosus)	Lamb and goat meat	
			sheep (liver)	Lamb and goat meat	
651	BS	Switzerland	beef (m. Longissimus dorsi)	Beef	GC
652	EX	Spain	lamb (m. Longissimus dorsi)	Lamb and goat meat	
654	BS	Spain	pork (cooked ham)	Pork	
655	EX	Brazil	lamb (m. Longissimus dorsi)	Lamb and goat meat	
657	EX	Spain	beef (m. Longissimus thoracis)	Beef	GC
658	EX	USA	cattle (back fat)	Beef	
659	BS	United Kingdom	chicken (breast)	Chicken meat	GC
660	EX	Croatia	chicken (meat)	Chicken meat	
661	EX	Taiwan	goat meat (m. Longissimus dorsi)	Lamb and goat meat	GC
662	EX	Croatia	chicken (breast)	Chicken meat	

ID, Paper unique identification number (see Table S1 for references); ST, Study type (CF – Comparison of Farms, BS – Basket Study, EX – Controlled Experiment); AM, analytical method of fatty acids assessment (GC – gas chromatography based, NIRS – NIR-spectroscopy calibrated with GC-data). *Information provided by author, considered as separate datapoints; †Studies which provided only brief descriptions of the methods used to assess fatty acids composition.

Table S3. Production systems information for studies with more than two systems.

ID	Species	SN	Production system	Additional comparisons used in the sensitivity analyses 2 and 3*
167	pig	1	organic (100% concentrate fed)	1 and 4
		2	organic (70% concentrate + 30% barley/pea silage fed)†	
		3	organic (70% concentrate + 30% clover/grass silage fed)†	
		4	conventional (100% concentrate fed)‡	
268	chicken	1	organic‡	1 and 3
		2	conventional (intensive)‡	
		3	conventional (free range)	
466	cattle	1	organic‡	1 and 3
		2	conventional (intensive)‡	
		3	conventional (pasture)	
469	cattle	1	organic‡	1 and 3
		2	conventional‡	
		3	conventional (intensive)	
485	cattle	1	organic‡	1 and 3
		2	conventional‡	
		3	conventional (intensive)	
568	chicken	1	organic‡	1 and 3
		2	conventional (standard)‡	1 and 4
		3	conventional (maize fed)	
		4	conventional (free range)	

ID, Paper unique identification number (see Table S1 for references); SN, number of the system. *Numbers refer to the SN within the same study; †Results from these treatments were averaged and used as a standard organic system in the meta-analysis; ‡Used as a standard system in the standard meta-analysis and sensitivity meta-analysis 1.

Table S3 cont. Production systems information for studies with more than two systems.

ID	Species	SN	Production system	Additional comparisons used in the sensitivity analyses 2 and 3*
569	chicken	1	organic‡	1 and 3
		2	conventional‡	
		3	conventional (free range)	
570	pig	1	organic (fed with limited mixture composed of organically grown cereals, legume seeds and rapeseed cake + ad libitum maize silage)†	
		2	organic (fed with limited mixture composed of organically grown cereals, legume seeds and rapeseed cake + ad libitum maize silage + 0.5% supplement of a herb mixture)†	
		3	organic (fed with limited mixture composed of organically grown cereals, legume seeds and rapeseed cake + ad libitum grass silage)†	
		4	organic (fed with limited mixture composed of organically grown cereals, legume seeds and rapeseed cake + ad libitum grass silage + 0.5% supplement of a herb mixture)†	
		5	conventional (soya-based mixture fed)	
640	rabbit	1	organic (local breed)‡	1 and 3
		2	conventional (local breed)‡	
		3	conventional (commercial hybrid)	
642	chicken	1	organic‡	1 and 3
		2	conventional‡	
		3	conventional (antibiotic free)	

ID, Paper unique identification number (see Table S1 for references); SN, number of the system. *Numbers refer to the SN within the same study; †Results from these treatments were averaged and used as a standard organic system in the meta-analysis; ‡Used as a standard system in the standard meta-analysis and sensitivity meta-analysis 1.

Table S3 cont. Production systems information for studies with more than two systems.

ID	Species	SN	Production system	Additional comparisons used in the sensitivity analyses 2 and 3*
645	chicken	1	organic‡	1 and 3
		2	conventional‡	
		3	conventional (free range)	
647	pig	1	organic (mainly concentrates fed)‡	2 and 4
		2	organic (concentrates fed, partly replaced by grass cobs)	3 and 4
		3	organic (concentrates fed, partly replaced by grass silage)	
		4	conventional‡	
648	chicken	1	organic (slow growing)‡	1 and 3
		2	conventional (slow growing)‡	
		3	conventional (fast growing)	
649	lamb	1	organic (low stocking)‡	
		2	conventional (low stocking)‡	
	lamb	1	organic (high stocking)‡	
		2	conventional (high stocking)‡	
658	cattle	1	organic (pasture + concentrate fed)‡	2 and 3
		2	organic (grass fed)	
		3	conventional‡	
661	goat	1	organic (dry mulberry leave fed)	1 and 3
		2	organic (alfalfa hay fed)‡	
		3	conventional‡	

ID, Paper unique identification number (see Table S1 for references); SN, number of the system. *Numbers refer to the SN within the same study; †Results from these treatments were averaged and used as a standard organic system in the meta-analysis; ‡Used as a standard system in the standard meta-analysis and sensitivity meta-analysis 1.

Table S4. Information extracted from the papers and included in the database used for meta-analysis.

Information about the paper	Paper ID, authors, publication year, title, journal/publisher, type of paper (journal article, conference proceedings, conference paper, report, book chapter, thesis), corresponding author, language of publication, information about peer-review, source of paper (electronic databases, contact with authors, reference list of reviews and original publications).
Study characteristics	Study type (Controlled Experiment - EX, Comparison of Farms - CF, Basket Study - BS), product, species, breed, production system description, experimental year(s), location of the study by country*, analytical methods used.
Data	Name of the compositional parameter, number of replicates, mean, SE or SD, measurement unit, data type (numeric, graphical).

*Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*)

Table S5. Summary of inclusion criteria used in the standard and the sensitivity analyses carried out. Detailed results of the sensitivity analysis are shown in the Appendix on the Newcastle University website (*http://research.ncl.ac.uk/nefg/QOF*)

Analysis	**Data available**		**Production systems compared**		**20% of studies with the least precise treatment effects excluded**	**Studies considered to have less scientifically sound methods of fatty acids assessments excluded†**
	Only papers reporting N, mean, SD/SE	All papers reporting means	Standard organic with standard conventional*	Each organic with each conventional		
Standard‡						
WM	+		+			
Sensitivity§						
1 (UM)‡		+	+			
2 (WM)	+			+		
3 (UM)		+		+		
4 (WM)	+		+		+	
5 (WM)	+		+			+

*A pragmatic choice was made to compare organic with a standard conventional comparator; †Five studies which provided only brief descriptions of the methods used (see Supplementary Table S3 and S2); ‡Results of the standard meta-analysis and sensitivity analysis 1 are presented in the main paper; §Sensitivity analysis was conducted to explore the robustness of the arbitrary decisions and to illustrate all effects (see Supplementary Table S3 for details and Appendix Table A1-3 for results of sensitivity analysis 2-5). WM, weighted meta-analysis; UM, unweighted meta-analysis.

Table S6. List of composition parameters included in the statistical analyses.*

Category	Parameters
Major components	Ash, Dry mass, Fat, Intramuscular fat, Protein, Water
Fatty acids	10:0 (capric acid), 12:0 (lauric acid), 14:0 (myristic acid), 14:1, 15:0 (pentadecanoic acid), 16:0 (palmitic acid), 16:1 (palmitoleic acid), 16:1 n-7, 16:1 n-9, 17:0 (heptadecanoic acid), 17:1 (heptadecenoic acid), 18:0 (stearic acid), 18:1 n-7, 20:0 (arachidic acid), 20:1 n-9, 20:2, 21:0, 22:0, 23:0 (cerotic acid), 24:0 (lignoceric acid), AA (cis-5,8,11,14-20:4), ALA (cis-9,12,15-18:3), cis-11,14-20:2 n-6, cis-11-20:1 (eicosenoic acid), CLA (cis-9-trans-11-18:2), CLA (total), CLA (trans-10-cis-12-18:2), CLA index, DGLA (cis-8,11,14-20:3), DHA (cis-4,7,10,13,16,19-22:6), DPA (cis-7,10,13,16,19-22:5), DTA (cis-7,10,13,16-22:4), EPA (cis-5,8,11,14,17-20:5), EPA+DHA†, ETE (cis-11,14,17-20:3), GLA (cis-6,9,12-18:3), LA (cis-9,12-18:2), LA/ALA ratio†, MUFA, n-3 FA, n-3/n-6 ratio, n-6 FA, n-6/n-3 ratio, OA (cis-9-18:1), PUFA, PUFA/SFA ratio, SFA, trans-18:1 (total), trans-18:1 n-9, trans-9-18:1, USFA, USFA/SFA ratio, VA (trans-11-18:1), VLC n-3 PUFA (EPA+DPA+DHA)†, Δ-9 desaturase 16:1/16:0 activity index, Δ-9 desaturase 18:1/18:0 activity index
Vitamins and antioxidants	α-tocopherol (total)
Minerals and undesirable metals	Arsenic (As), Cadmium (Cd), Copper (Cu), Iron (Fe), Iron (Fe) (in haemoglobin), Lead (Pb), Selenium (Se), Zinc (Zn)
Pesticides, mycotoxins and other contaminants	4-4'-DDD, 4-4'-DDE, 4-4'-DDT, Aldrin, Chlorpyrifos, Diazinon, Dieldrin, Disyston, Endrin, Ethion, Ethyl parathion, Heptachlor, Hexachlorobenzene (HCB), Lindane, Malathion, Methoxychlor, Methyl parathion, Mirex, Pirimiphos-Me, Ronnel, Trithion, α-benzene hexachloride (α-BHC), β-benzene hexachloride (β-BHC), δ-benzene hexachloride (δ-BHC)
Other	Atherogenicity Index (AI), Atherogenicity Index (AI)†, Campylobacter spp., Cholesterol, Lipid oxidation (TBARS), pH, Thrombogenicity index (TI), Thrombogenicity Index (TI)†

*Compounds for which number of comparisons organic vs. conventional was ≥ 3, †Calculated based on published fatty acids composition data.

Table S7. List of composition parameters excluded from the statistical analyses.*

Category	Parameters
Major components	Abdominal fat, Carbohydrate, Intra-abdominal fat, Meat weight (hind leg), Meat weight (loin weight), Meat/bone ratio
Fatty acids	11:0, 13:0, 14:1 n-6, 15:1, 18:1 (total), 18:1 n-12, 18:1 n-5, 18:2, 18:3, 18:4 n-3, 19:0, 20:1 (eicosanoic acid), 20:1 (gadoleic acid), 20:3, 20:3 n-6, 20:4, 22:1, 22:2, 22:2 n-6, 22:4 n-3, 24:1 n-9, 25:1, 3S,7R,11R,15-phytanic acid (SRR), 6:0 (caproic acid), 8:0 (caprylic acid), AA/EPA ratio, anteiso-15:0, branched-15:0, branched-16:0, branched-17:0, cis-11-18:1 (cis-vaccenic acid), cis-12,15-18:2, cis-12-18:1, cis-13-18:1, cis-14,trans-16-18:1, cis-15-18:1, cis-18:1 (total), cis-8-20:1, cis-9,15-18:2, cis-9-trans-12-18:2 + trans-9,12-18:2, cis-9-trans-13-18:2, cis-MUFA, cis-PUFA, CLA (cis-9,11-18:2), DPA (cis-7,10,13,16,19-22:5), iso-14:0, iso-15:0, iso-16:0, iso-17:0, LA/ALA ratio, LCFA, MCFA, MUFA/SFA ratio, Other FA, SCFA, trans-10-18:1, trans-10-18:1 + trans-11-18:1, trans-11-cis15-18:2, trans-12,13,14-18:1, trans-16:1 (trans-palmitelaidic acid), trans-16-18:1, trans-18:2 n-6, trans-6,7,8-18:1, trans8-cis-13-18:2, trans-9,11-18:2, trans-9,12-18:2, trans-9-16:1, trans-FA, Triglycerides
N components	Alanine (Ala), Ammonia, Arginine (Arg), Arginine (Arg) + Threonine (Thr), Aspartic acid (Asp), Cadaverine, Carnosine, Citrulline, Creatine, Cysteine (Cys), Dipeptides (total), Free Amino Acids (FAA) total, Glutamic acid (Glu), Glycine (Gly), Histidine (His), Isoleucine (Ile), Leucine (Leu), Lysine (Lys), Methionine (Met), Nitrate, Nitrite, Ornithine, Phenylalanine (Phe), Proline (Pro), Serine (Ser), Taurine, Threonine (Thr), Tryptophan (Trp), Tyrosine (Tyr), Valine (Val), β-Alanine
Vitamins and antioxidants	Anserine, Glutathione (GSH), Retinol, β-carotene, γ-tocopherol
Minerals and undesirable metals	Calcium (Ca), Chromium (Cr), Cobalt (Co), Magnesium (Mg), Manganese (Mn), Mercury (Hg), Molybdenum (Mo), Nickel (Ni), Other Arsenic species, Phosphorus (P), Potassium (K), Sodium (Na)
Pesticides, mycotoxins and other contaminants	2-amino-3,4,8-trimethylimidazo[4,5-f]quinoxaline (4,8-DiMeIQx), 3-amino-2-oxazolidinone, carbonyls, chlorinated hydrocarbon pesticides, cis-clordane, cis-clordene, Dimethyl arsinate (DMA), Eptachlor, Esachlorciclohexane (HCH), Heptachlor epoxide, o,p'DDD, o,p'DDE, o,p'DDT, Octaclorostyrene, Organophosphate pesticides, Ossiclordane, p,p'DDD, p,p'DDE, Pesticide residues, Polychlorinated biphenyls (PCB), Quintozene, Roxarsone, trans-clordane, trans-clordene, trans-nonachlor, α-endosulfan

*Compounds for which number of comparisons organic vs. conventional was < 3.

Table S7 cont. List of composition parameters excluded from the statistical analyses.*

Category	Parameters
Volatile compounds	1,2-Propanediol, 1,8-cineole, 1.19-eicosadienoic acid, 1-dodecanol, 1-heptanol, 1-hexanedecanol, 1-hydroxy-2-propanone, 1-nonene, 1-octen-3-ol, 1-octene, 1-pentanol, 1-propanol, 1-tetradecanol, 1-tridecanol, 2,2,4,6,6-pentametilheptanal, 2,3-octanedione, 2,3-pentanedione, 2/3-methylthiophene + isobutyl acetate, 2-butanone, 2-ethyl-1-hexanol, 2-ethylfuran, 2-heptanone, 2-hexanone, 2-isobutyl-4-methylpyridine, 2-methyl-3-pentanone, 2-methylbutanal, 2-methylbutanoic acid, 2-methyl-dihydro-3(H)-furanone, 2-methylpropanal, 2-nonenal, 2-octanone, 2-pentanone, 2-pentyl, 2-pentylfuran, 2-phenoxyethanol, 2-propanol, 2-undecenal, 3-hydroxy-2-butanone, 3-methyl-1-butanol, 3-methyl-2-butenal, 3-methylbutanal, 3-methylbutanenitrile, 3-methylbutanoic acid, 3-methylhexane, 3-methylnonane, 3-phenylpropionitrile, 4-methyl-3-penten-2-one, 4-methylnonane, 4-methylpentanenitrile, Acetic acid, Benzaldehyde, Benzamide, Benzoic acid, Benzophenone, Benzothiazole, Benzylcyanide, Butyl acetate, Cyclohexanone, Decanal, Decanenitrile, Dimethyl disulphide, Dimethyl tetrasulphide, Dimethyl trisulphide, Dodecanal, Dodecanoic acid, Ethanol, Ethyl acetate, Formaldehyde, Furfural, Heptanal, Heptane, Heptanol, Hexadecanal, Hexanal, Hexanoic acid, Hexanol, Indole, Isobutyramide, Limonene, Methylcyclohexane, Methylpyrazine, n-formylmorpholine, n-formylpiperidine, n-heptanal, n-methylbenzamide, Nonanal, Nonanoic acid, Octanal, Octane, Pentanal, Pentanoic acid, Propanoic acid, Pyrazine, Pyrrole, Tetradecanal, Tetradecane, Tetradecanenitrile, Tetradecanoic acid, Thiazole, Thiophene, Tridecane, Undecanal, Xylene, γ-aminobutyric lactam
Other	1-methyl-9H-pyrido[3,4-b]indole (harmane), 2-amino-1-methyl-6-phenylimidazo-[4,5-b]pyridine (PhIP), 2-amino-3,8-dimethylimidazo[4,5-f]quinoxaline (MeIQx), 9H-pyrido[3,4-b]indole (norharmane), Aerobic bacteria, Catalase, E. coli, Ether extract, Glutathione peroxidase (GPx), Glutathione reductase (GR), Glycogen (residual), Gross energy, Heterocyclic amines (HCAs) (total), Metmyoglobin, NaCl, Phosphates, Putrescine, Staphylococcus spp., Total coliforms

*Compounds for which number of comparisons organic vs. conventional was < 3.

2. ADDITIONAL METHODS

The methods for random-effects model used in weighted meta-analysis were previously described by Baranski *et al.*[1].

2.1. Calculations used for weighted meta-analyses

The SMD from a single study was calculated in random-effect model using standard formulas within "metafor" as follows:

$$SMD = \frac{\bar{X}_O - \bar{X}_C}{S_{within}} \times J$$

where $\bar{X}o$ is the mean value for experimental group (organic), $\bar{X}_C$ is the mean value for control group (conventional), S_{within} is the pooled standard deviation of the two groups, and J is a factor used to correct for small sample size. J is calculated as:

$$J = 1 - \frac{3}{4 \times (n_C + n_O - 2) - 1}$$

where n_O and n_C are organic and conventional sample sizes.

S_{within} is calculated as:

$$S_{within} = \sqrt{\frac{(n_O - 1)S_O^2 + (n_C - 1)S_C^2}{n_O + n_C - 2}}$$

where S_O and S_C are the standard deviations in individual systems (organic and conventional) respectively.

The pooled SMD (SMD_{tot}) across all studies was calculated as:

$$SMD_{tot} = \frac{\sum_{i=1}^{n}(\frac{1}{v_i} \times SMD_i)}{\sum_{i=1}^{n}(\frac{1}{v_i})}$$

Where v_i is a sampling variance estimated as:

$$v_i = \frac{n_C + n_O}{n_C \times n_O} + \frac{SMD^2}{2 \times (n_C + n_O)}$$

The pooled or summary effect (SMD_{tot}) was calculated for all nutrient- and composition-related parameters reported in a minimum of 3 studies, following procedures advocated by Lipsey and Wilson[2].

2.2. Calculations used for percentage mean differences (MPDs)

For each data-pair ($\bar{X}_O$, $\bar{X}_C$) extracted from the literature and used in the meta-analysis the percentage difference was calculated as:

$+[(\bar{X}_O \times 100/\bar{X}_C) - 100]$ for data sets where $\bar{X}_O > \bar{X}_C$, or

$-[(\bar{X}_C \times 100/\bar{X}_O) - 100]$ for data sets where $\bar{X}_C > \bar{X}_O$

3. ADDITIONAL RESULTS

Supplementary Table S8 shows the basic information/statistics on the publications/data used for meta-analyses of composition parameters included in Fig. 2-4 in the main paper.

Supplementary Table S9 and S10 shows the mean percentage differences (MPD) and standard errors (SE) calculated using the data included in for standard and sensitivity 1 meta-analyses of composition parameters shown in Fig. 2-4 of the main paper (MPDs are also shown as symbols in Fig. 2-4).

Supplementary Table S11 shows the meta-analysis results for addition composition parameters (protein, 20:0 (arachidic acid), 14:1, 16:1 (palmitoleic acid), 17:1 (heptadecenoic acid), CLA (cis-9-trans-11-18:2), PUFA/SFA ratio, *n*-3/*n*-6 ratio, EPA+DHA, atherogenicity index, thrombogenicity index, cholesterol, lipid oxidation (TBARS)) for which significant differences were detected by the standard and sensitivity 1 meta-analyses protocols.

Supplementary Figures S3 to S5 show forest plots and the results of the standard and sensitivity 1 meta-analyses random-effect and mixed-effect models with study type as moderator, for data from studies which compared the composition of organic and conventional animal products.

Supplementary Figures S6 to S35 show forest plots comparing SMDs from standard meta-analysis random-effect and mixed-effect models for different animal groups, for composition parameters for which significant difference between organic and conventional animal products were found by one of the meta-analyses protocols.

Supplementary Table S12 shows the results of the standard and sensitivity 1 meta-analyses for parameters where none of the meta-analyses protocols detected significant differences between organic and conventional meat.

Supplementary Table S13 shows the results of the statistical tests for publication bias ported in Table 1 of the main paper.

Table S8. Basic information/statistics on the publications/data used for meta-analyses of composition parameters included in Fig. 2 in the main paper.

					Number of comparisons reporting that concentrations were					
			Total sample size*		numerically higher in		identical	significantly higher in		not significantly different§
Parameter	**Studies**	***n***	**ORG**	**CONV**	**ORG**	**CONV**		**ORG†**	**CONV‡**	
Fat	31	34	622	618	8	25	1	2	8	11
Intramuscular fat	9	9	207	215	3	6	0	1	4	1
SFA	34	38	725	704	18	20	0	2	7	11
12:0 (lauric acid)	13	15	261	234	7	7	1	1	1	8
14:0 (myristic acid)	25	27	450	449	10	16	1	1	5	10
16:0 (palmitic acid)	28	30	511	508	13	17	0	0	3	13
MUFA	32	36	706	690	10	26	0	1	9	9
OA (cis-9-18:1)	25	27	482	483	11	16	0	2	4	10
PUFA	31	35	688	672	28	6	1	10	1	7
n-3 FA	27	31	557	537	24	7	0	9	0	5
ALA (cis-9,12,15-18:3)	27	32	477	449	23	9	0	6	1	8
EPA (cis-5,8,11,14,17-20:5)‖	19	23	348	329	12	11	0	4	1	4
DPA (cis-7,10,13,16,19-22:5)	12	15	290	257	10	5	0	4	0	4
DHA (cis-4,7,10,13,16,19-22:6)	19	23	348	329	13	9	1	5	0	4
VLC n-3 PUFA (EPA+DPA+DHA)¶	12	15	290	257	11	4	0	-	-	-
n-6 FA	25	29	534	507	19	10	0	6	0	8
LA (cis-9,12-18:2)	2	2	29	31	1	1	0	0	0	1
AA (cis-5,8,11,14-20:4)‖	21	24	363	344	11	13	0	2	3	7
LA/ALA ratio¶	25	28	428	420	10	18	0	-	-	-
n-6/n-3 ratio	28	32	612	590	10	22	0	1	5	8

n, numbers of data points (comparisons) included in the meta-analysis; ORG, organic samples; CONV, conventional samples; SFA, saturated fatty acids; MUFA, monounsaturated fatty acids; OA, oleic acid; PUFA, polyunsaturated fatty acids; FA, fatty acids; ALA, α-linolenic acid; EPA, eicosapentaenoic acid; DPA, docosapentaenoic acid; DHA, docosahexaenoic acid; VLC n-3 PUFA, very long chain n-3 PUFA; LA, linoleic acid; AA, arachidonic acid. *Total number of samples analysed in different publications; †The number of comparisons in which statistically significant difference was found with higher level in ORG; ‡The number of comparisons in which statistically significant difference was found with higher level in CONV; §The number of comparisons in which there was no significant difference between ORG and CONV; ‖Outlying data pairs (where the MPD between ORG and CONV was over fifty times greater than the mean value including the outliers) were removed; ¶Calculated based on published fatty acids composition data.

Table S9. Mean percentage differences (MPD) and confidence intervals (CI) calculated using the data included in standard meta-analyses and sensitivity meta-analysis 1 of composition parameters shown in Fig. 2 of the main paper (MPDs are also shown as symbols in Fig. 2).

	Calculated based on data included in					
	standard meta-analysis			**sensitivity meta-analysis 1**		
Parameter	***n***	**MPD***	**95% CI**	***n***	**MPD***	**95% CI**
Fat	22	-22.21	-43.92, -0.51	34	-21.46	-40.34, -2.59
Intramuscular fat	7	-12.40	-37.76, 12.97	9	-21.73	-45.58, 2.12
SFA	26	-2.37	-5.69, 0.94	38	-1.67	-4.17, 0.83
12:0 (lauric acid)	11	4.94	-21.44, 31.31	15	7.94	-12.61, 28.48
14:0 (myristic acid)	23	-18.35	-31.97, -4.72	27	-18.11	-30.25, -5.97
16:0 (palmitic acid)	24	-10.85	-27.67, 5.98	30	-8.50	-22.03, 5.02
MUFA	24	-7.97	-12.47, -3.48	36	-6.55	-10.01, -3.09
OA (cis-9-18:1)	22	-3.71	-8.43, 1.01	27	-4.91	-9.16, -0.66
PUFA	23	23.29	11.27, 35.31	35	18.90	7.28, 30.51
n-3 FA	21	46.99	10.08, 83.89	31	38.38	12.16, 64.61
ALA (cis-9,12,15-18:3)	22	17.00	-11.49, 45.49	32	35.08	1.34, 68.82
EPA (cis-5,8,11,14,17-20:5)†	13	0.93	-37.51, 39.37	20	-6.11	-35.79, 23.56
DPA (cis-7,10,13,16,19-22:5)	11	30.45	-0.18, 61.07	15	29.49	7.07, 51.91
DHA (cis-4,7,10,13,16,19-22:6)	14	13.84	-35.39, 63.07	22	8.63	-23.91, 41.18
VLC n-3 PUFA (EPA+DPA+DHA)‡	-	-	-	15	24.20	3.57, 44.83
n-6 FA	19	16.34	1.73, 30.94	29	12.57	1.92, 23.22
LA (cis-9,12-18:2)	23	8.53	-11.48, 28.55	30	9.69	-7.07, 26.44
AA (cis-5,8,11,14-20:4)†	13	11.67	-8.16, 31.50	19	1.40	-14.68, 17.47
LA/ALA ratio‡	-	-	-	28	-20.43	-40.41, -0.45
n-6/n-3 ratio	17	-21.98	-46.56, 2.60	32	-27.71	-48.05, -7.38

n, number of data points included in the comparison; MPD, mean percentage difference; SFA, saturated fatty acids; MUFA, monounsaturated fatty acids; OA, oleic acid; PUFA, polyunsaturated fatty acids; FA, fatty acids; ALA, α-linolenic acid; EPA, eicosapentaenoic acid; DPA, docosapentaenoic acid; DHA, docosahexaenoic acid; VLC n-3 PUFA, very long chain n-3 PUFA; LA, linoleic acid; AA, arachidonic acid. *Magnitude of difference between organic (ORG) and conventional (CONV) samples (value <0 indicate higher concentration in CONV, value >0 indicate higher concentration in ORG); †Outlying data pairs (where the MPD between ORG and CONV was over fifty times greater than the mean value including the outliers) were removed; ‡Calculated based on published fatty acids composition data.

Table S10. Mean percentage differences (MPD) and confidence intervals (CI) calculated using the data included in standard meta-analyses and sensitivity meta-analysis 1 of composition parameters shown in Fig. 3 and 4 of the main paper (MPDs are also shown as symbols in Fig. 3 and 4).

	Calculated based on data included in					
Parameter/	**standard meta-analysis**			**sensitivity meta-analysis 1**		
Animal group*	***n***	**MPD†**	**95% CI**	***n***	**MPD†**	**95% CI**
Fat						
Beef	6	-40.10	-97.52, 17.31	7	-35.83	-85.07, 13.41
Lamb and goat meat	7	11.08	-5.62, 27.78	11	-5.44	-31.32, 20.43
Pork	-	-	-	5	-4.64	-24.65, 15.37
Chicken meat	4	-50.04	-90.14, -9.93	9	-31.90	-79.37, 15.56
Intramuscular fat						
Pork	4	0.31	-20.30, 20.92	5	-6.42	-27.13, 14.29
SFA						
Beef	5	-5.27	-19.50, 8.95	8	-3.92	-12.70, 4.86
Lamb and goat meat	9	-0.56	-3.60, 2.47	14	0.53	-2.20, 3.27
Pork	4	-2.88	-7.09, 1.32	6	-4.60	-8.01, -1.18
Chicken meat	5	-2.71	-12.48, 7.05	7	-0.99	-8.09, 6.11
12:0 (lauric acid)						
Beef	-	-	-	4	-13.03	-25.86, -0.20
Lamb and goat meat	7	5.87	-26.08, 37.82	9	13.15	-13.70, 40.01
14:0 (myristic acid)						
Beef	5	-23.30	-43.41, -3.20	6	-19.03	-37.46, -0.60
Lamb and goat meat	9	2.03	-4.48, 8.53	11	0.42	-6.35, 7.20
Pork	4	-17.40	-43.87, 9.08	4	-17.40	-43.87, 9.08
Chicken meat	4	-65.22	-109.31, -21.13	5	-63.35	-97.70, -29.00
16:0 (palmitic acid)						
Beef	5	-4.07	-10.44, 2.30	7	-2.55	-7.35, 2.26
Lamb and goat meat	9	-0.18	-2.25, 1.89	11	-0.01	-1.81, 1.79
Pork	4	-3.19	-7.22, 0.84	5	-3.70	-6.97, -0.42
Chicken meat	5	-45.45	-124.69, 33.79	6	-36.73	-103.65, 30.18
MUFA						
Beef	4	-10.84	-26.15, 4.47	7	-7.86	-16.55, 0.83
Lamb and goat meat	8	1.16	-2.11, 4.43	13	-0.84	-4.69, 3.02
Pork	4	-7.30	-11.88, -2.73	6	-2.98	-9.33, 3.36
Chicken meat	5	-19.67	-25.82, -13.53	7	-17.47	-23.83, -11.11

n, number of data points included in the comparison; MPD, mean percentage difference; SFA, saturated fatty acids; MUFA, monounsaturated fatty acids. *The summary results and product groups for which n≤3 were removed (for summary results see Table S9.), †Magnitude of difference between organic (ORG) and conventional (CONV) samples (value <0 indicate higher concentration in CONV, value >0 indicate higher concentration in ORG).

Table S10 cont. Mean percentage differences (MPD) and confidence intervals (CI) calculated using the data included in standard meta-analyses and sensitivity meta-analysis 1 of composition parameters shown in Fig. 3 and 4 of the main paper (MPDs are also shown as symbols in Fig. 3 and 4).

	Calculated based on data included in					
Parameter/	**standard meta-analysis**			**sensitivity meta-analysis 1**		
Animal group*	***n***	**MPD†**	**95% CI**	***n***	**MPD†**	**95% CI**
OA (cis-9-18:1)						
Beef	5	2.96	-6.25, 12.18	6	1.83	-6.01, 9.67
Lamb and goat meat	9	-0.74	-2.71, 1.23	11	-2.16	-5.82, 1.51
Pork	4	-2.99	-11.97, 5.99	5	-3.72	-10.82, 3.38
Chicken meat	-	-	-	4	-25.71	-29.06, -22.36
PUFA						
Beef	4	29.43	5.58, 53.29	7	18.13	1.62, 34.63
Lamb and goat meat	7	8.96	-0.63, 18.55	12	17.28	-4.12, 38.68
Pork	4	25.35	0.81, 49.88	6	9.33	-23.91, 42.57
Chicken meat	5	41.74	-2.69, 86.17	7	32.27	-0.81, 65.36
n-3 FA						
Beef	-	-	-	7	55.42	22.50, 88.35
Lamb and goat meat	8	8.54	-4.19, 21.28	11	11.05	-2.36, 24.46
Chicken meat	6	66.20	-16.20, 148.6	8	41.64	-26.96, 110.24
ALA (cis-9,12,15-18:3)						
Beef	4	46.72	22.50, 70.94	8	43.61	31.21, 56.01
Lamb and goat meat	8	13.39	-4.27, 31.05	12	57.96	-15.82, 131.74
Pork	4	-6.51	-50.46, 37.45	5	-0.70	-36.60, 35.19
Chicken meat	5	28.11	-92.77, 148.99	6	19.36	-80.82, 119.54
EPA (cis-5,8,11,14,17-20:5)‡						
Beef	-	-	-	5	55.74	28.96, 82.53
Lamb and goat meat	7	-17.96	-72.62, 36.71	10	-25.88	-68.30, 16.55
Chicken meat	-	-	-	4	-24.33	-94.40, 45.74
DPA (cis-7,10,13,16,19-22:5)						
Beef	-	-	-	5	54.59	13.57, 95.62
Lamb and goat meat	7	19.55	-13.60, 52.71	8	22.79	-6.62, 52.2
DHA (cis-4,7,10,13,16,19-22:6)						
Beef	-	-	-	5	39.39	-15.78, 94.56
Lamb and goat meat	6	27.41	-13.98, 68.80	10	19.94	-6.40, 46.29
Chicken meat	5	-19.41	-139.29, 100.48	6	-31.18	-131.75, 69.39

n, number of data points included in the comparison; MPD, mean percentage difference; OA, oleic acid; PUFA, polyunsaturated fatty acids; FA, fatty acids; ALA, α-linolenic acid; EPA, eicosapentaenoic acid; DPA, docosapentaenoic acid; DHA, docosahexaenoic acid;. *The summary results and product groups for which n≤3 were removed (for summary results see Table S9.), †Magnitude of difference between organic (ORG) and conventional (CONV) samples (value <0 indicate higher concentration in CONV, value >0 indicate higher concentration in ORG); ‡Outlying data pairs (where the MPD between ORG and CONV was over fifty times greater than the mean value including the outliers) were removed.

Table S10 cont. Mean percentage differences (MPD) and confidence intervals (CI) calculated using the data included in standard meta-analyses and sensitivity meta-analysis 1 of composition parameters shown in Fig. 3 and 4 of the main paper (MPDs are also shown as symbols in Fig. 3 and 4).

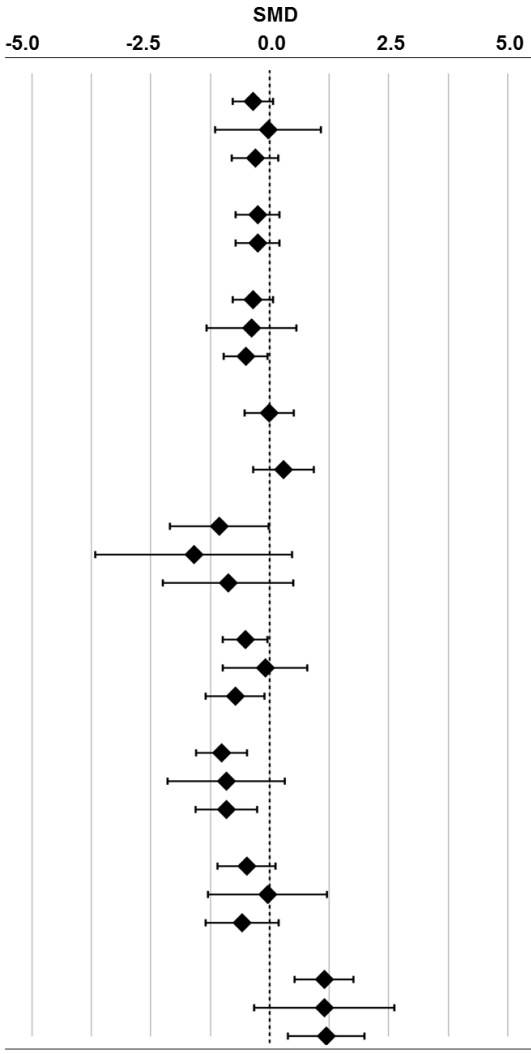
	Calculated based on data included in					
Parameter/	**standard meta-analysis**			**sensitivity meta-analysis 1**		
Animal group*	***n***	**MPD†**	**95% CI**	***n***	**MPD†**	**95% CI**
VLC n-3 PUFA (EPA+DPA+DHA)§						
Beef	-	-	-	5	52.69	18.88, 86.49
Lamb and goat meat	-	-	-	8	12.89	-13.71, 39.48
LA/ALA ratio§						
Beef	-	-	-	7	-42.06	-69.11, -15
Lamb and goat meat	-	-	-	10	-36.11	-77.72, 5.49
Pork	-	-	-	5	9.41	-13.84, 32.65
n-6 FA						
Beef	-	-	-	7	1.46	-17.58, 20.51
Lamb and goat meat	8	3.13	-9.90, 16.15	11	1.56	-7.94, 11.05
Chicken meat	4	48.33	-2.01, 98.66	6	36.89	1.40, 72.37
LA (cis-9,12-18:2)						
Beef	5	20.12	-8.92, 49.17	8	6.51	-15.31, 28.34
Lamb and goat meat	8	4.86	-6.22, 15.93	10	13.19	-7.43, 33.82
Pork	4	3.20	-40.31, 46.70	5	8.91	-26.60, 44.42
Chicken meat	5	8.56	-78.80, 95.92	6	10.13	-61.26, 81.53
AA (cis-5,8,11,14-20:4)‡						
Beef	-	-	-	4	3.81	-17.79, 25.41
Lamb and goat meat	6	0.17	-19.37, 19.71	8	-5.36	-21.87, 11.16
Chicken meat	-	-	-	4	24.16	-35.40, 83.72
n-6/n-3 ratio						
Beef	5	-55.73	-106.62, -4.83	9	-60.25	-93.88, -26.61
Lamb and goat meat	6	-1.47	-9.16, 6.23	13	-23.79	-55.76, 8.19
Chicken meat	-	-	-	5	12.33	-36.71, 61.37

n, number of data points included in the comparison; MPD, mean percentage difference; VLC n-3 PUFA, very long chain n-3 PUFA; EPA, eicosapentaenoic acid; DPA, docosapentaenoic acid; DHA, docosahexaenoic acid; FA, fatty acids; LA, linoleic acid; AA, arachidonic acid. *The summary results and product groups for which n≤3 were removed (for summary results see Table S9.), †Magnitude of difference between organic (ORG) and conventional (CONV) samples (value <0 indicate higher concentration in CONV, value >0 indicate higher concentration in ORG); ‡Outlying data pairs (where the MPD between ORG and CONV was over fifty times greater than the mean value including the outliers) were removed; §Calculated based on published fatty acids composition data.

Table S11. Meta-analysis results for additional composition parameters (protein, 20:0 (arachidic acid), 14:1, 16:1 (palmitoleic acid), 17:1 (heptadecenoic acid), CLA (cis-9-trans-11-18:2), PUFA/SFA ratio, n-3/n-6 ratio, EPA+DHA, atherogenicity index, thrombogenicity index, cholesterol, lipid oxidation (TBARS), Cu, Fe) for which significant differences were detected by the standard and sensitivity meta-analysis 1 protocols.

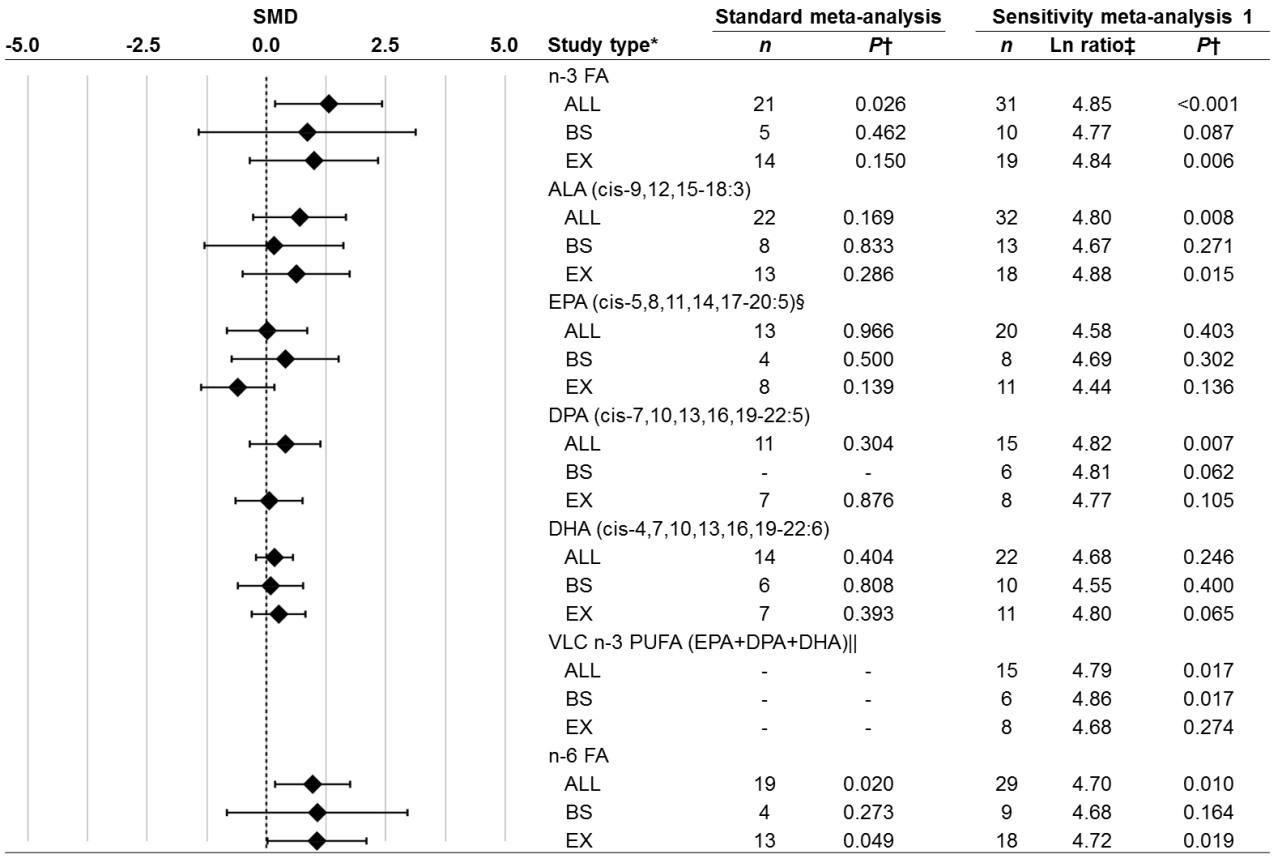
	Standard meta-analysis							Sensitivity meta-analysis 1				
Parameter	***n***	**SMD**	**95% CI**	***P****	**Heterogeneity†**	**MPD‡**	**95% CI**	***n***	**Ln ratio§**	***P****	**MPD‡**	**95% CI**
Protein	17	0.19	-0.17, 0.54	0.307	Yes (78%)	1.02	-0.51, 2.55	23	4.62	0.059	1.07	-0.20, 2.34
20:0 (arachidic acid)	9	0.33	-0.15, 0.81	0.177	Yes (81%)	53.61	-39.93, 147.16	12	4.91	0.020	66.98	-14.18, 148.14
14:1	4	-0.02	-0.43, 0.39	0.909	No (0%)	-1.85	-15.46, 11.77	6	4.42	0.141	-27.93	-76.62, 20.77
16:1 (palmitoleic acid)	18	-0.10	-0.36, 0.16	0.443	Yes (53%)	-9.10	-30.33, 12.13	23	4.55	0.182	-10.04	-27.65, 7.57
17:1 (heptadecenoic acid)	8	0.29	-0.30, 0.89	0.331	Yes (82%)	16.18	-6.24, 38.59	11	4.73	0.049	15.23	-1.27, 31.74
CLA (cis-9-trans-11-18:2)	5	-0.66	-1.19, -0.13	0.015	Yes (68%)	-22.17	-44.50, 0.16	11	4.59	0.411	-2.19	-21.96, 17.59
PUFA/SFA ratio	4	2.75	-2.05, 7.55	0.261	Yes (100%)	50.44	-33.29, 134.16	10	4.85	0.015	36.28	-1.26, 73.82
n-3/n-6 ratio	-	-	-	-	-	-	-	31	4.80	0.008	29.21	5.86, 52.56
EPA+DHA¶	-	-	-	-	-	-	-	22	4.70	0.262	26.34	-55.90, 108.59
Atherogenicity index	4	0.47	-0.17, 1.11	0.148	Yes (79%)	6.64	-0.66, 13.94	5	4.67	0.062	7.02	1.32, 12.72
Atherogenicity index¶	-	-	-	-	-	-	-	13	4.58	0.221	-2.53	-8.37, 3.3
Thrombogenicity index	4	-0.35	-0.64, -0.06	0.018	No (0%)	-4.40	-6.73, -2.08	5	4.57	0.028	-3.99	-5.97, -2.02
Thrombogenicity index¶	-	-	-	-	-	-	-	15	4.54	0.025	-7.77	-15.1, -0.44
Cholesterol	-	-	-	-	-	-	-	5	4.58	0.189	-3.01	-10.60, 4.59
Lipid oxidation (TBARS)‖	8	0.19	-0.18, 0.56	0.310	Yes (52%)	23.03	-9.35, 55.42	11	4.75	0.050	19.53	-4.09, 43.15
Se	-	-	-	-	-	-	-	3	4.53	0.256	-8.12	-27.34, 11.1
Cu	3	-4.77	-8.92, -0.63	0.024	Yes (98%)	-25.96	-42.61, -9.30	4	4.36	0.064	-27.80	-40.12, -15.48
Fe	4	1.00	-0.65, 2.66	0.236	Yes (96%)	13.79	2.14, 25.43	5	4.77	0.068	18.86	5.44, 32.27

n, number of data points included in the comparison; MPD, mean percentage difference; SMD, standardised mean difference of random-effect model; CLA, conjugated linoleic acids; PUFA, polyunsaturated fatty acids; SFA, saturated fatty acids EPA, eicosapentaenoic acid; DHA, docosahexaenoic acid. **P* value <0.05 indicates significance of the difference in composition between organic and conventional meat; †Heterogeneity and the I^2 Statistic; ‡Magnitude of difference between organic (ORG) and conventional (CONV) samples (value <0 indicate higher concentration in CONV, value >0 indicate higher concentration in ORG); §Ln ratio = Ln(ORG/CONV × 100%); ‖Outlying data pairs (where the MPD between ORG and CONV was over fifty times greater than the mean value including the outliers) were removed; ¶Calculated based on published fatty acids composition data.



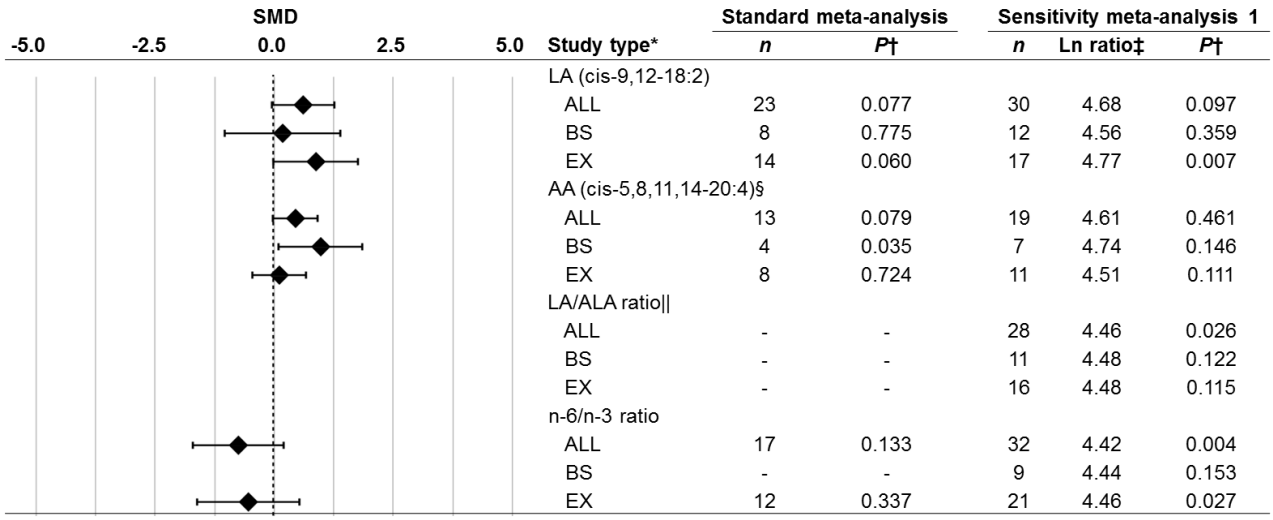
Study type*	Standard meta-analysis *n*	Standard meta-analysis *P*†	Sensitivity meta-analysis 1 *n*	Sensitivity meta-analysis 1 Ln ratio‡	Sensitivity meta-analysis 1 *P*†
Fat					
ALL	22	0.125	34	4.45	0.012
BS	4	0.961	6	4.53	0.283
EX	16	0.257	26	4.47	0.035
Intramuscular fat					
ALL	7	0.331	9	4.44	0.065
EX	7	0.331	8	4.49	0.128
SFA					
ALL	26	0.127	38	4.59	0.103
BS	5	0.440	10	4.59	0.192
EX	19	0.043	26	4.58	0.078
12:0 (lauric acid)					
ALL	11	0.974	15	4.66	0.270
BS	-	-	5	4.42	0.062
EX	7	0.389	9	4.80	0.058
14:0 (myristic acid)					
ALL	23	0.049	27	4.47	0.003
BS	7	0.138	9	4.35	0.013
EX	15	0.222	17	4.53	0.096
16:0 (palmitic acid)					
ALL	24	0.044	30	4.55	0.043
BS	8	0.851	11	4.51	0.333
EX	15	0.030	18	4.58	0.036
MUFA					
ALL	24	<0.001	36	4.55	<0.001
BS	5	0.155	10	4.53	0.021
EX	17	0.008	24	4.56	0.010
OA (cis-9-18:1)					
ALL	22	0.138	27	4.56	0.016
BS	6	0.946	8	4.54	0.111
EX	15	0.153	18	4.57	0.075
PUFA					
ALL	23	<0.001	35	4.75	<0.001
BS	5	0.133	10	4.68	0.202
EX	16	0.005	23	4.78	<0.001

Figure S3. Results of the standard meta-analyses and sensitivity meta-analysis 1 for different study types for fat composition in meat. SMD, standardised mean difference with 95% confidence intervals represented by horizontal bars; *n*, number of data points included in meta-analyses; CF, comparison of farms, BS, basket study, EX, controlled experiment; SFA, saturated fatty acids; MUFA, monounsaturated fatty acids; OA, oleic acid; PUFA, polyunsaturated fatty acids. *for parameters for which $n \leq 3$ for specific study type, results obtained in the weighted meta-analyses are not shown, †*P* value <0.05 indicates a significant difference between ORG and CONV, ‡Ln ratio = Ln(ORG/CONV × 100%).



Study type*	Standard meta-analysis *n*	Standard meta-analysis *P*†	Sensitivity meta-analysis 1 *n*	Sensitivity meta-analysis 1 Ln ratio‡	Sensitivity meta-analysis 1 *P*†
n-3 FA					
ALL	21	0.026	31	4.85	<0.001
BS	5	0.462	10	4.77	0.087
EX	14	0.150	19	4.84	0.006
ALA (cis-9,12,15-18:3)					
ALL	22	0.169	32	4.80	0.008
BS	8	0.833	13	4.67	0.271
EX	13	0.286	18	4.88	0.015
EPA (cis-5,8,11,14,17-20:5)§					
ALL	13	0.966	20	4.58	0.403
BS	4	0.500	8	4.69	0.302
EX	8	0.139	11	4.44	0.136
DPA (cis-7,10,13,16,19-22:5)					
ALL	11	0.304	15	4.82	0.007
BS	-	-	6	4.81	0.062
EX	7	0.876	8	4.77	0.105
DHA (cis-4,7,10,13,16,19-22:6)					
ALL	14	0.404	22	4.68	0.246
BS	6	0.808	10	4.55	0.400
EX	7	0.393	11	4.80	0.065
VLC n-3 PUFA (EPA+DPA+DHA)‖					
ALL	-	-	15	4.79	0.017
BS	-	-	6	4.86	0.017
EX	-	-	8	4.68	0.274
n-6 FA					
ALL	19	0.020	29	4.70	0.010
BS	4	0.273	9	4.68	0.164
EX	13	0.049	18	4.72	0.019

Figure S4. Results of the standard meta-analyses and sensitivity meta-analysis 1 for different study types for fat composition in meat. SMD, standardised mean difference with 95% confidence intervals represented by horizontal bars; n, number of data points included in meta-analyses; CF, comparison of farms, BS, basket study, EX, controlled experiment; FA, fatty acids; ALA, α-linolenic acid; EPA, eicosapentaenoic acid; DPA, docosapentaenoic acid; DHA, docosahexaenoic acid; VLC n-3 PUFA, very long chain n-3 polyunsaturated fatty acids. *For parameters for which $n \leq 3$ for specific study type, results obtained in the weighted meta-analyses are not shown, †*P* value <0.05 indicates a significant difference between ORG and CONV, ‡Ln ratio = Ln(ORG/CONV × 100%), §outlying data points (where the MPD between ORG and CONV was more than fifty times greater than the mean value including the outliers) were removed, ‖calculated based on published fatty acids composition data.



Study type*	Standard meta-analysis *n*	Standard meta-analysis *P*†	Sensitivity meta-analysis 1 *n*	Sensitivity meta-analysis 1 Ln ratio‡	Sensitivity meta-analysis 1 *P*†
LA (cis-9,12-18:2)					
ALL	23	0.077	30	4.68	0.097
BS	8	0.775	12	4.56	0.359
EX	14	0.060	17	4.77	0.007
AA (cis-5,8,11,14-20:4)§					
ALL	13	0.079	19	4.61	0.461
BS	4	0.035	7	4.74	0.146
EX	8	0.724	11	4.51	0.111
LA/ALA ratio‖					
ALL	-	-	28	4.46	0.026
BS	-	-	11	4.48	0.122
EX	-	-	16	4.48	0.115
n-6/n-3 ratio					
ALL	17	0.133	32	4.42	0.004
BS	-	-	9	4.44	0.153
EX	12	0.337	21	4.46	0.027

Figure S5. Results of the standard meta-analyses and sensitivity meta-analysis 1 for different study types for fat composition in meat. SMD, standardised mean difference with 95% confidence intervals represented by horizontal bars; n, number of data points included in meta-analyses; CF, comparison of farms, BS, basket study, EX, controlled experiment; LA, linoleic acid; AA, arachidonic acid; ALA, α-linolenic acid. *For parameters for which $n \leq 3$ for specific study type, results obtained in the weighted meta-analyses are not shown, †*P* value <0.05 indicates a significant difference between ORG and CONV, ‡Ln ratio = Ln(ORG/CONV × 100%), §outlying data points (where the MPD between ORG and CONV was more than fifty times greater than the mean value including the outliers) were removed, ‖calculated based on published fatty acids composition data.

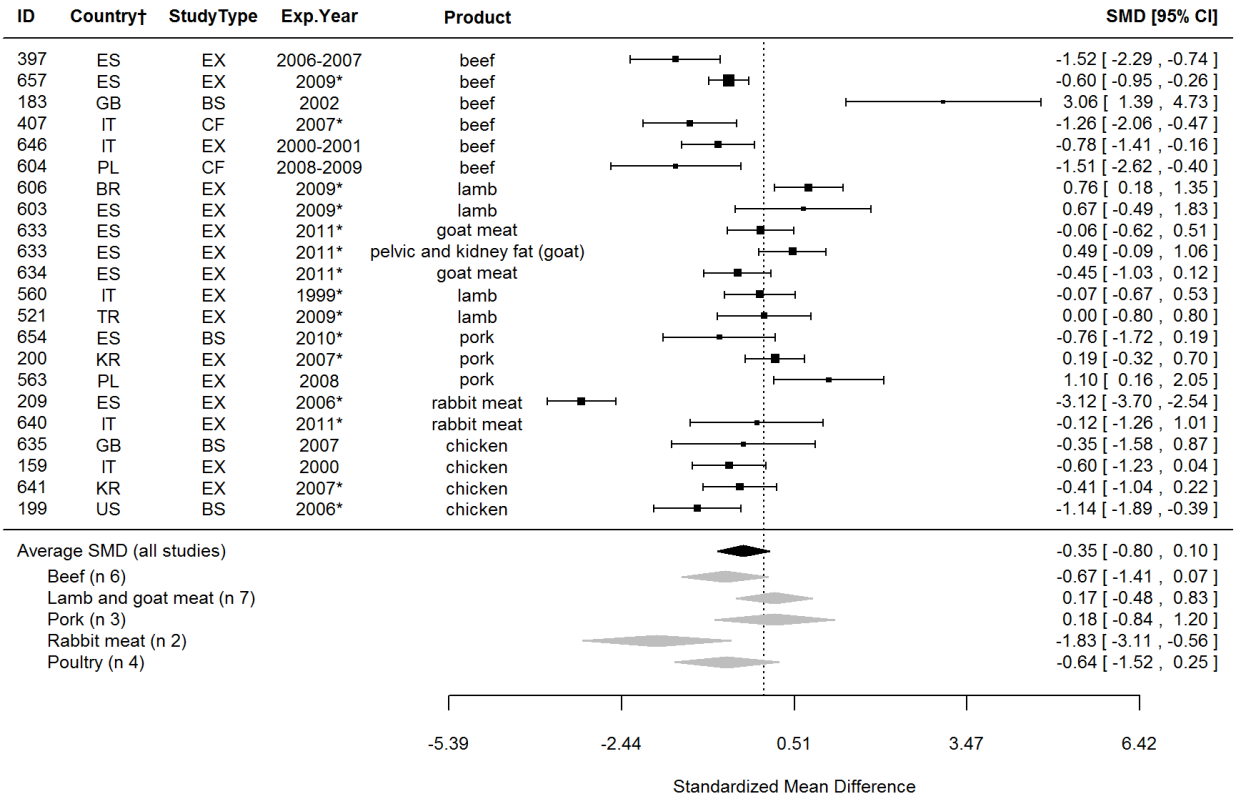


Figure S6. Forest plot showing the results of the comparison of fat content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

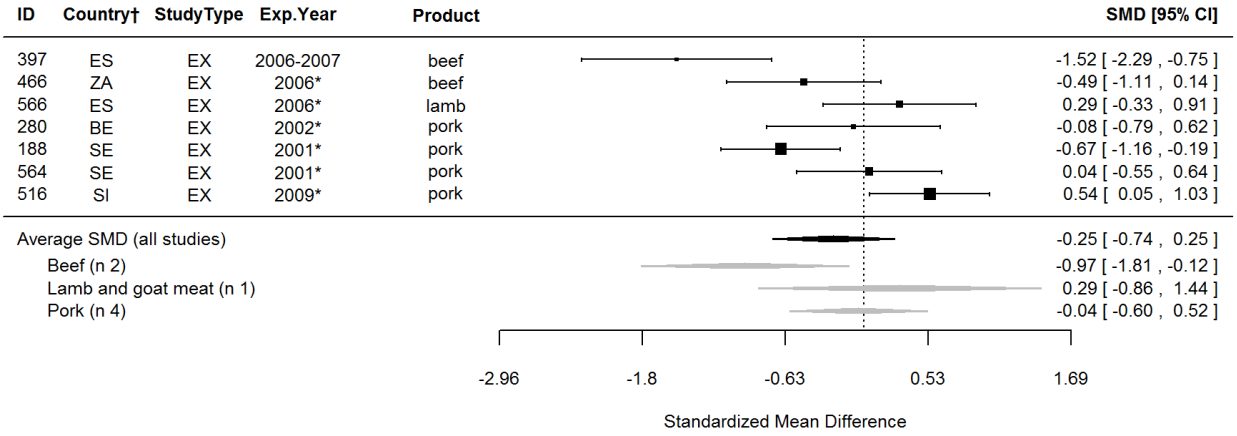


Figure S7. Forest plot showing the results of the comparison of intramuscular fat content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

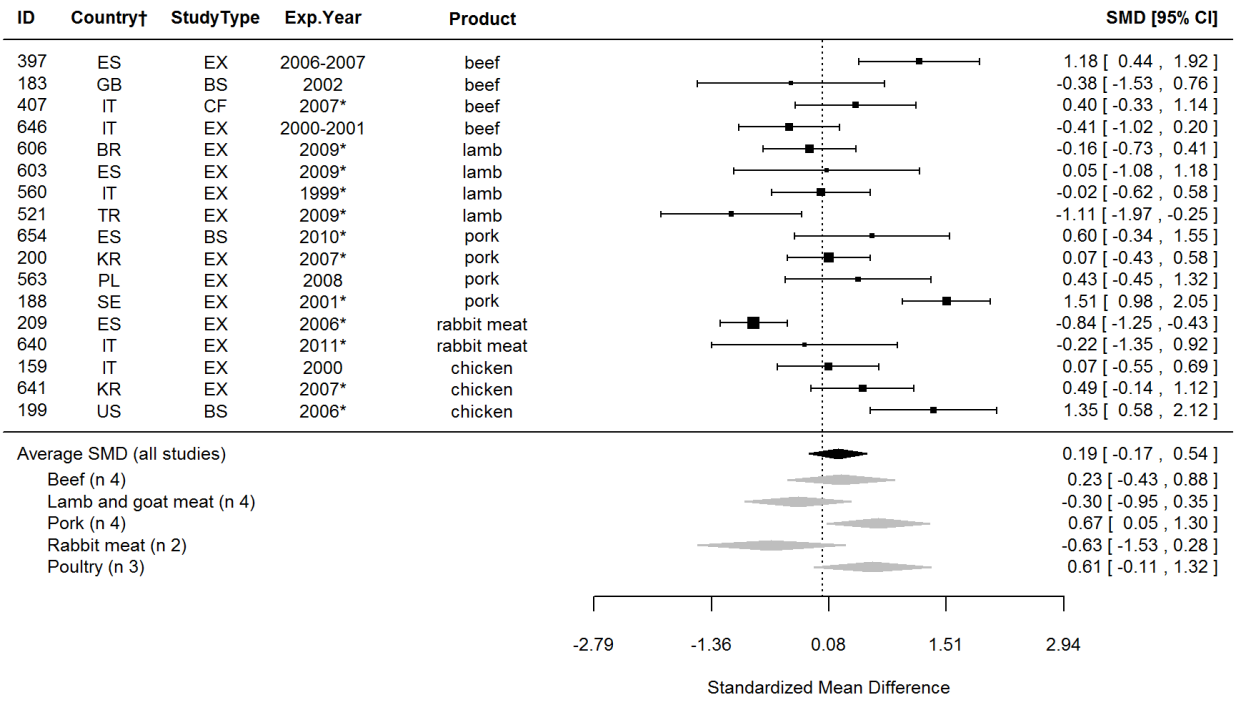


Figure S8. Forest plot showing the results of the comparison of protein content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

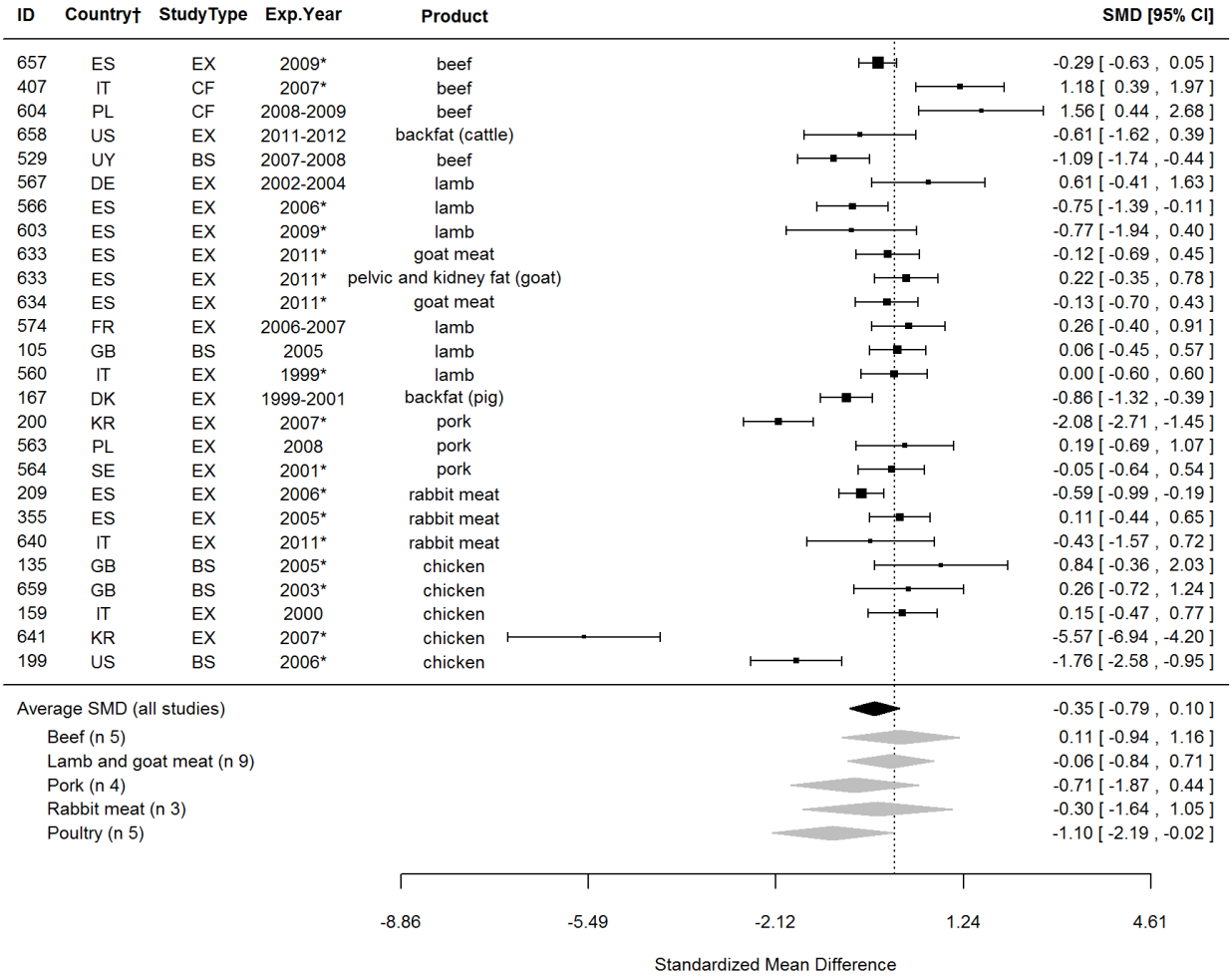


Figure S9. Forest plot showing the results of the comparison of saturated fatty acids (SFA) content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

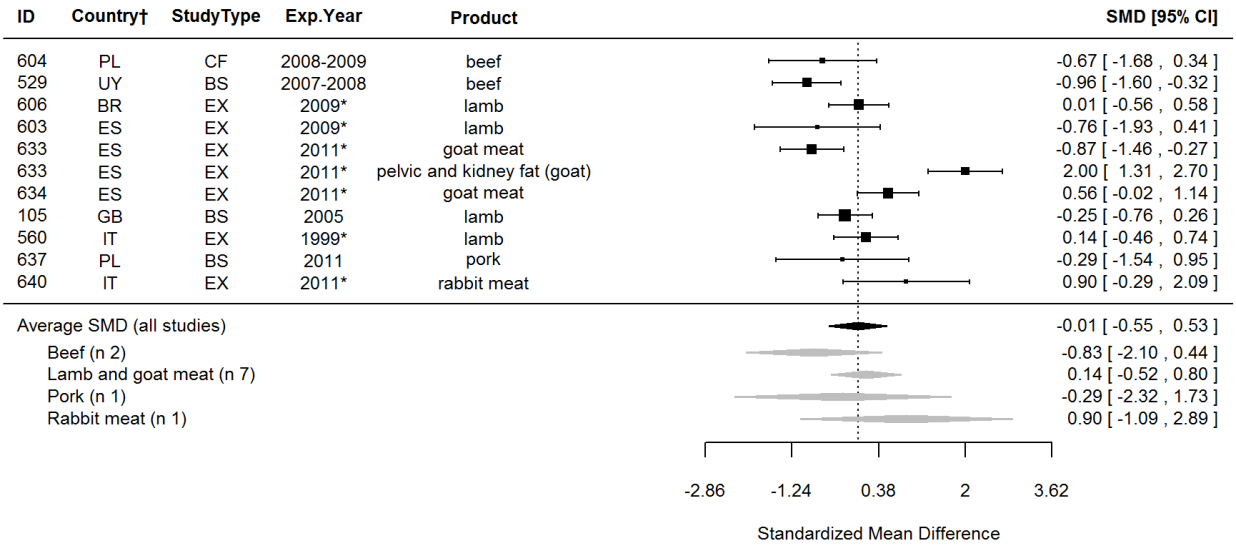


Figure S10. Forest plot showing the results of the comparison of 12:0 (lauric acid) content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

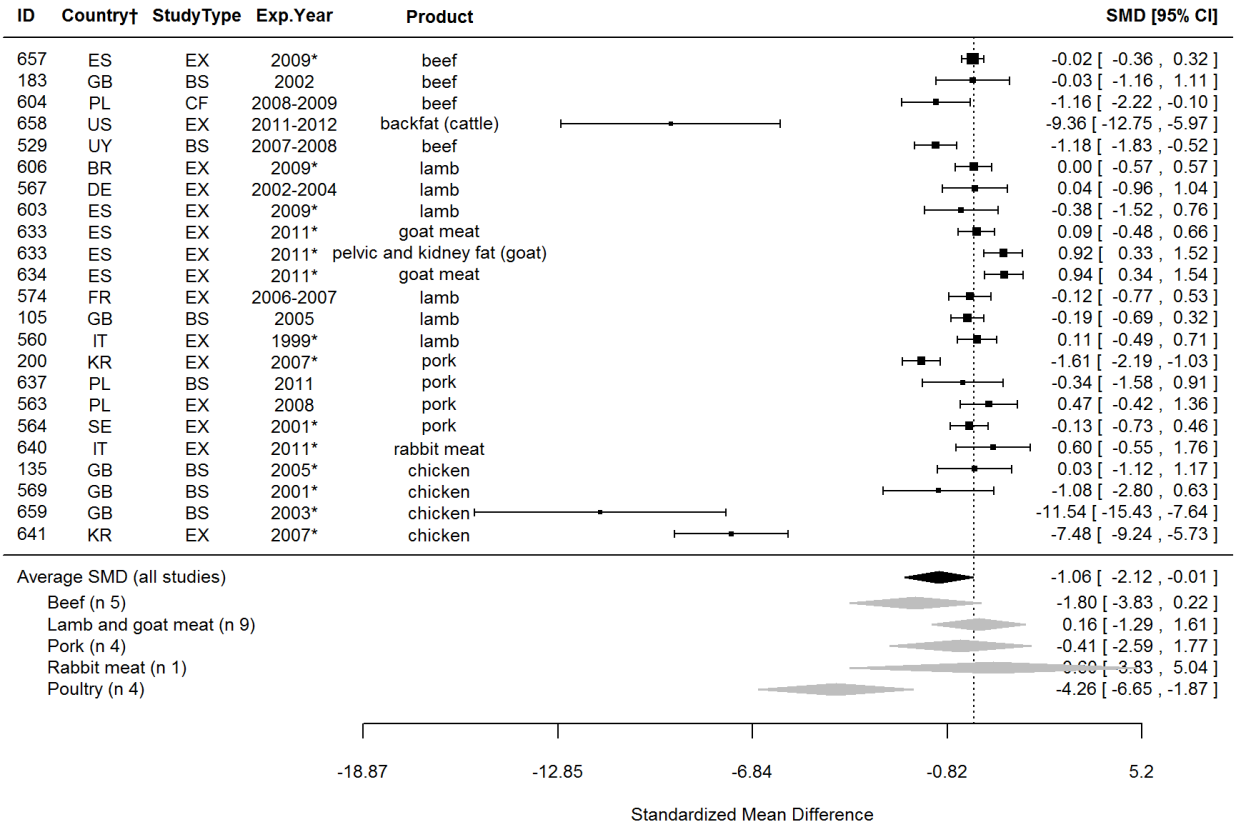


Figure S11. Forest plot showing the results of the comparison of 14:0 (myristic acid) content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

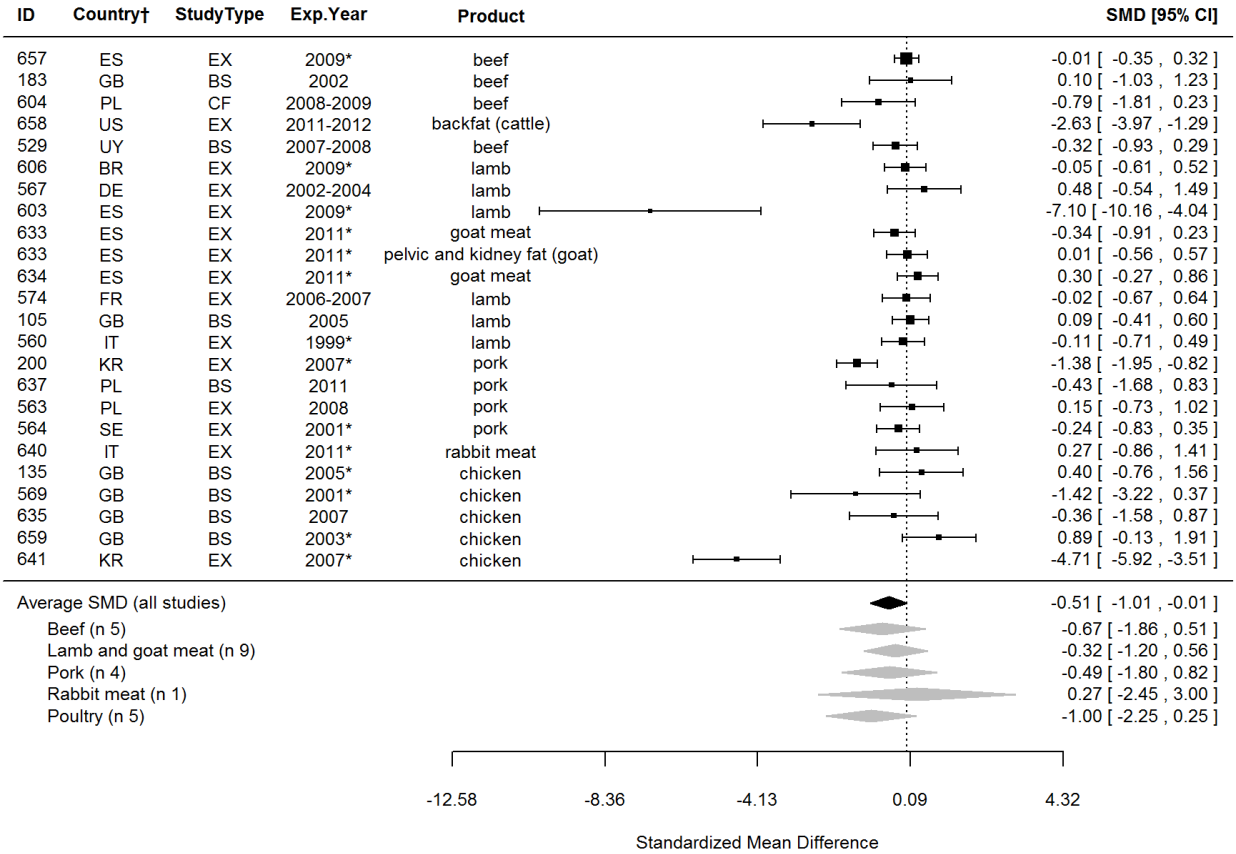


Figure S12. Forest plot showing the results of the comparison of 16:0 (palmitic acid) content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

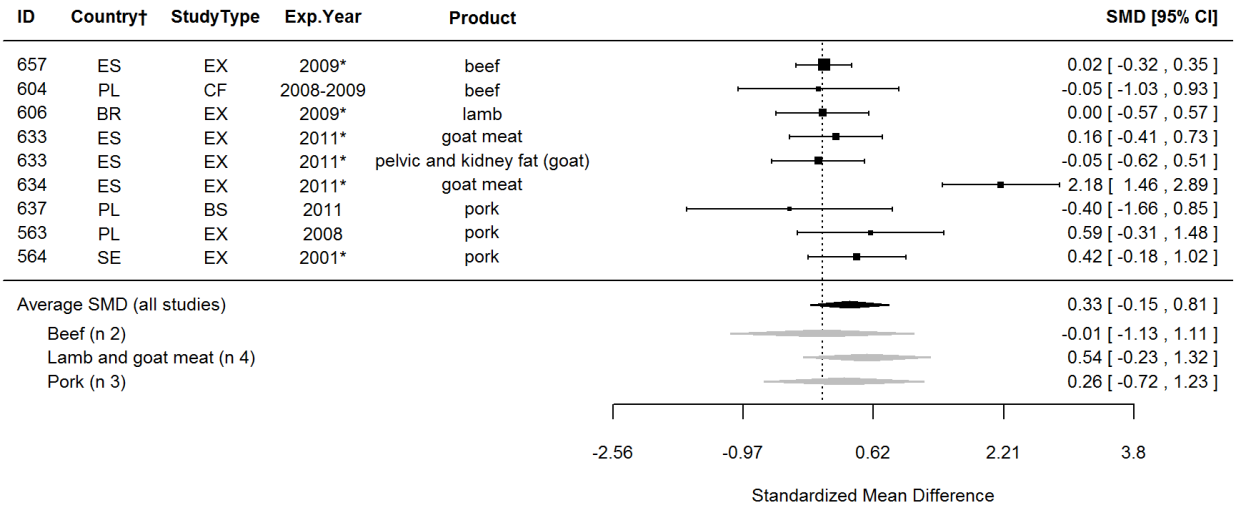


Figure S13. Forest plot showing the results of the comparison of 20:0 (arachidic acid) content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

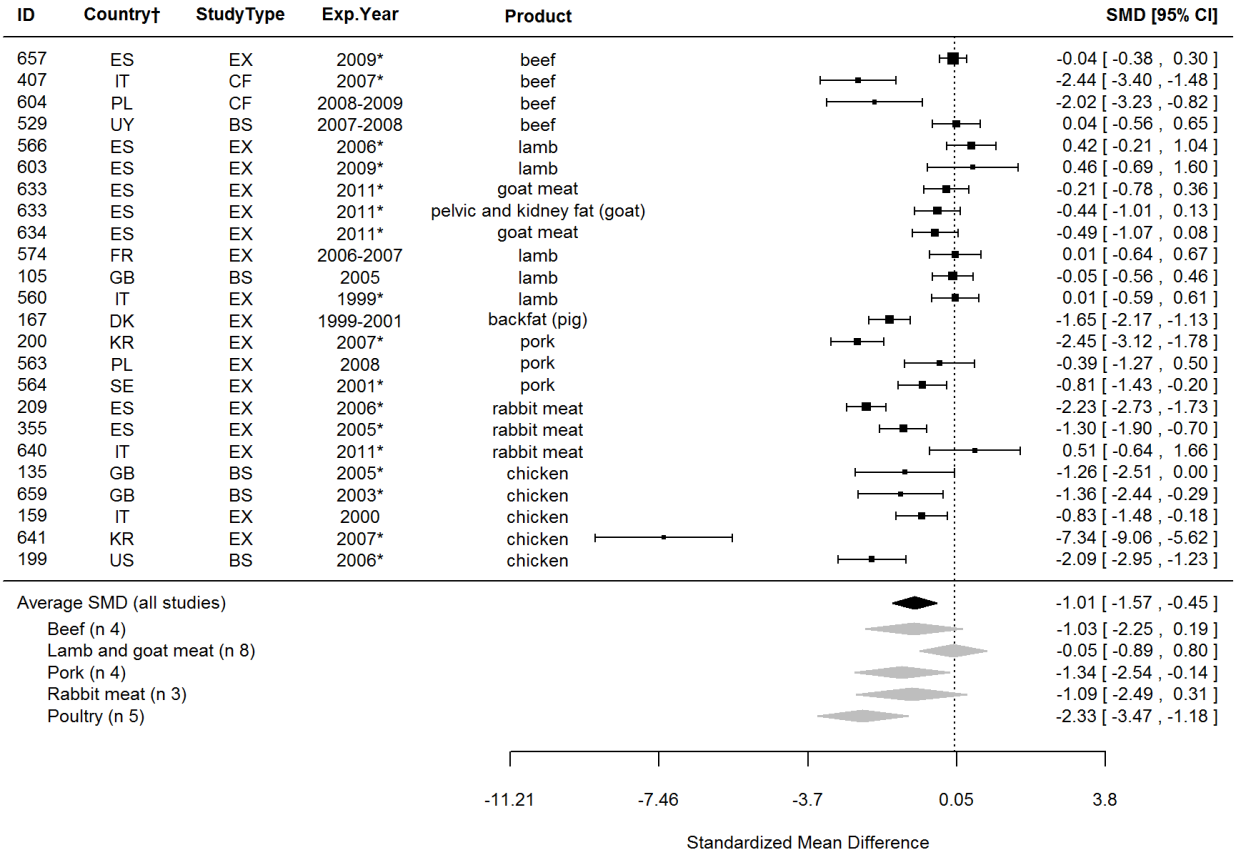


Figure S14. Forest plot showing the results of the comparison of monounsaturated fatty acids (MUFA) content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

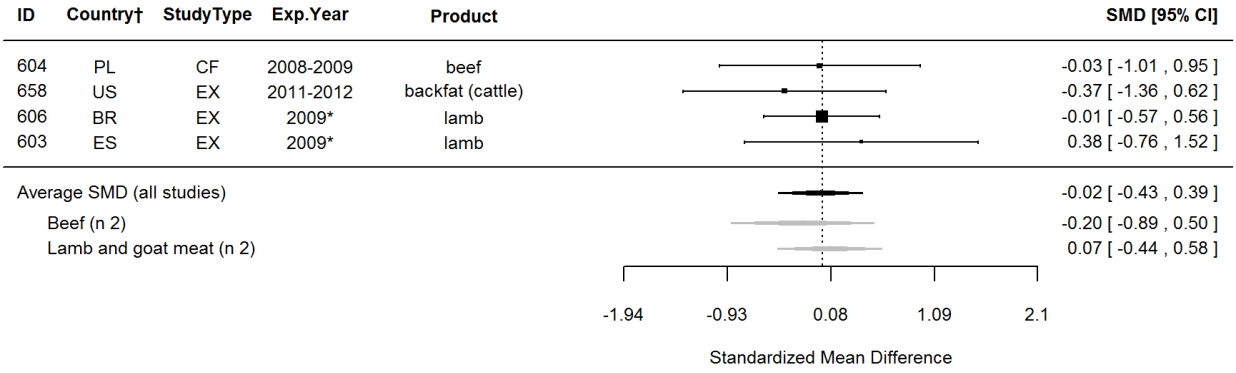


Figure S15. Forest plot showing the results of the comparison of 14:1 fatty acid content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

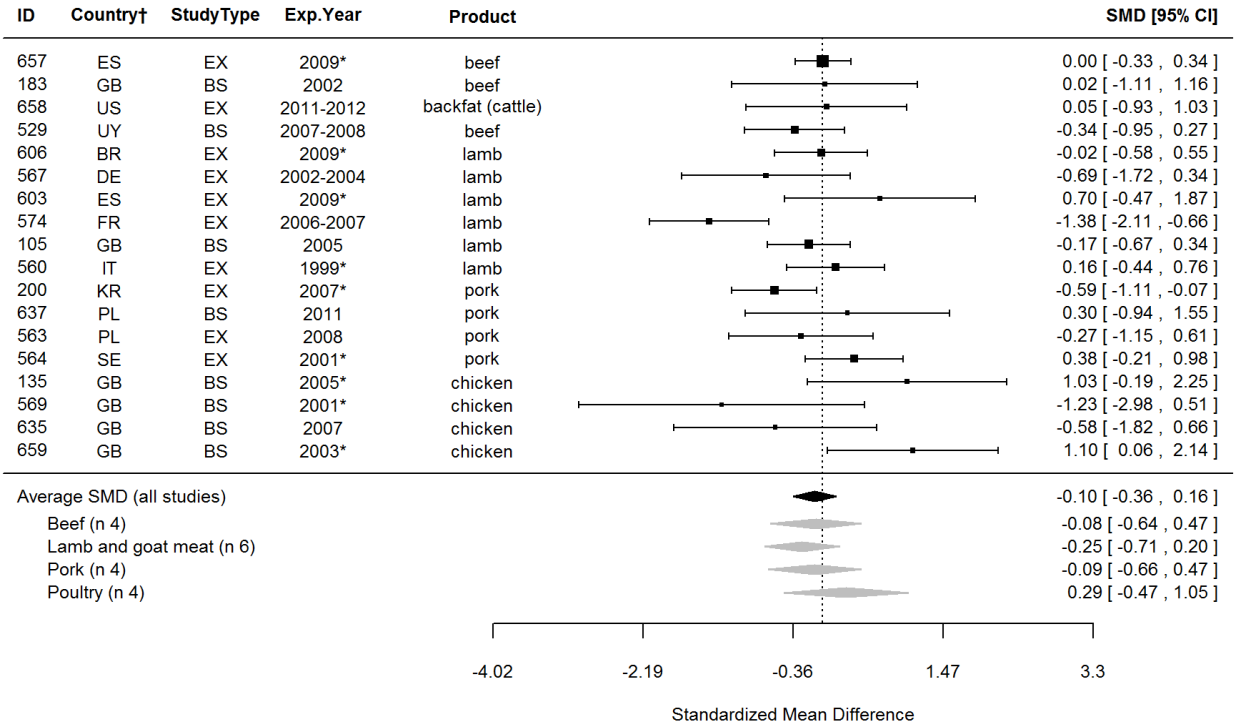


Figure S16. Forest plot showing the results of the comparison of 16:1 (palmitoleic acid) content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

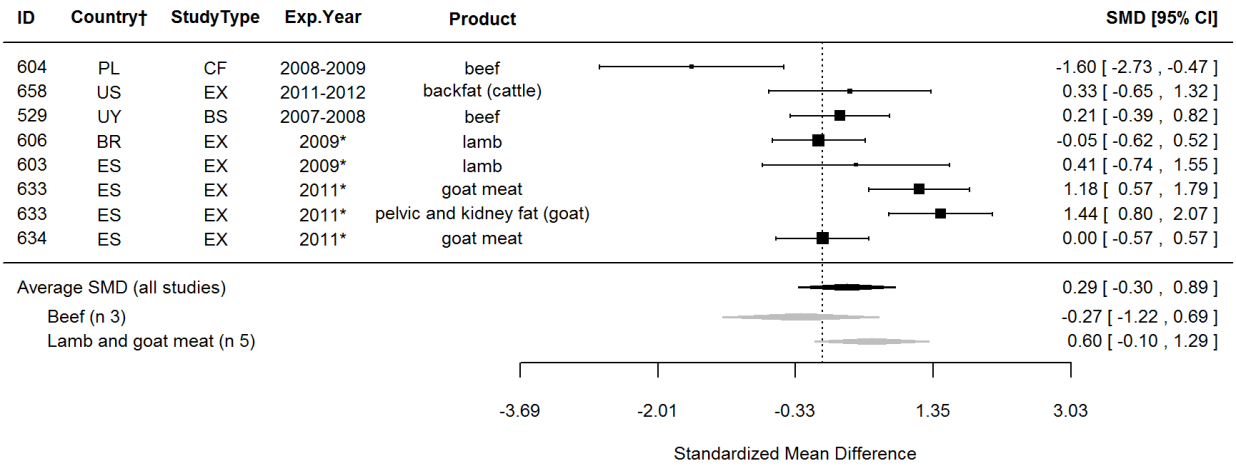


Figure S17. Forest plot showing the results of the comparison of 17:1 (heptadecenoic acid) content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

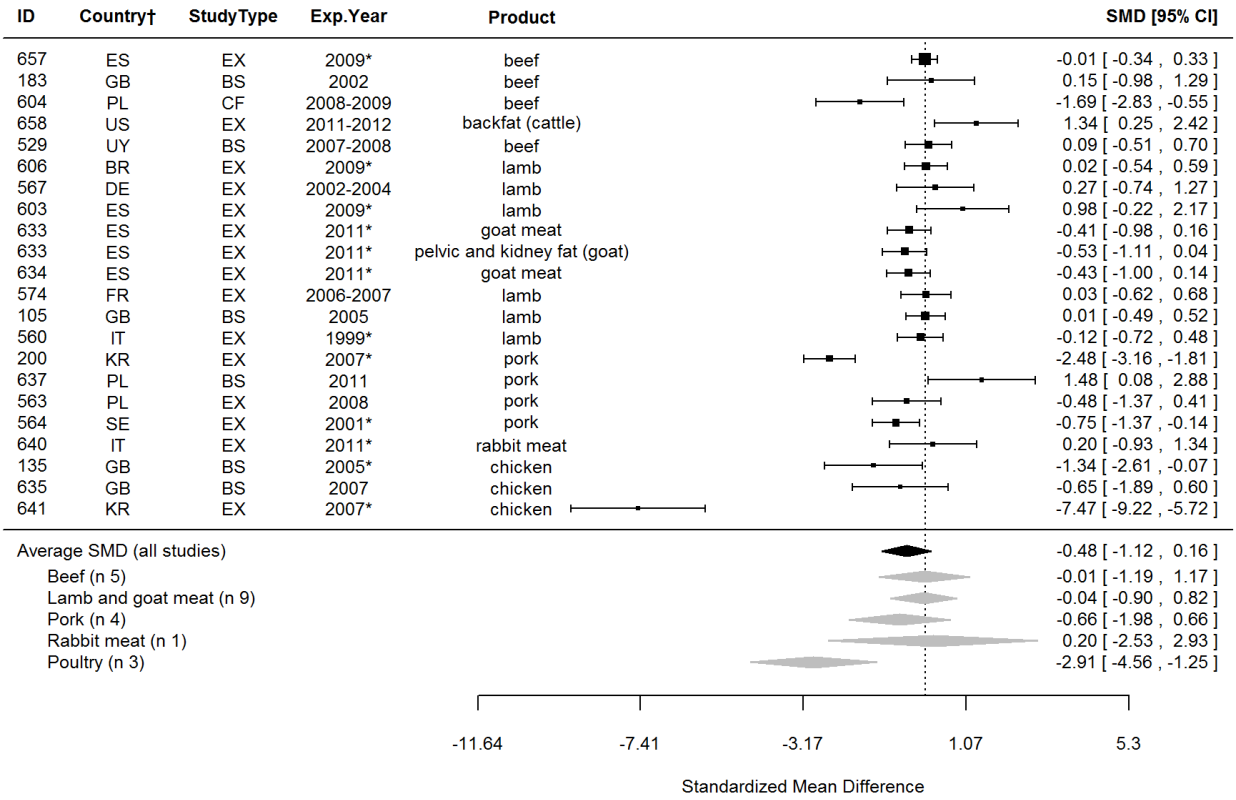


Figure S18. Forest plot showing the results of the comparison of oleic acid (OA, cis-9-18:1) content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

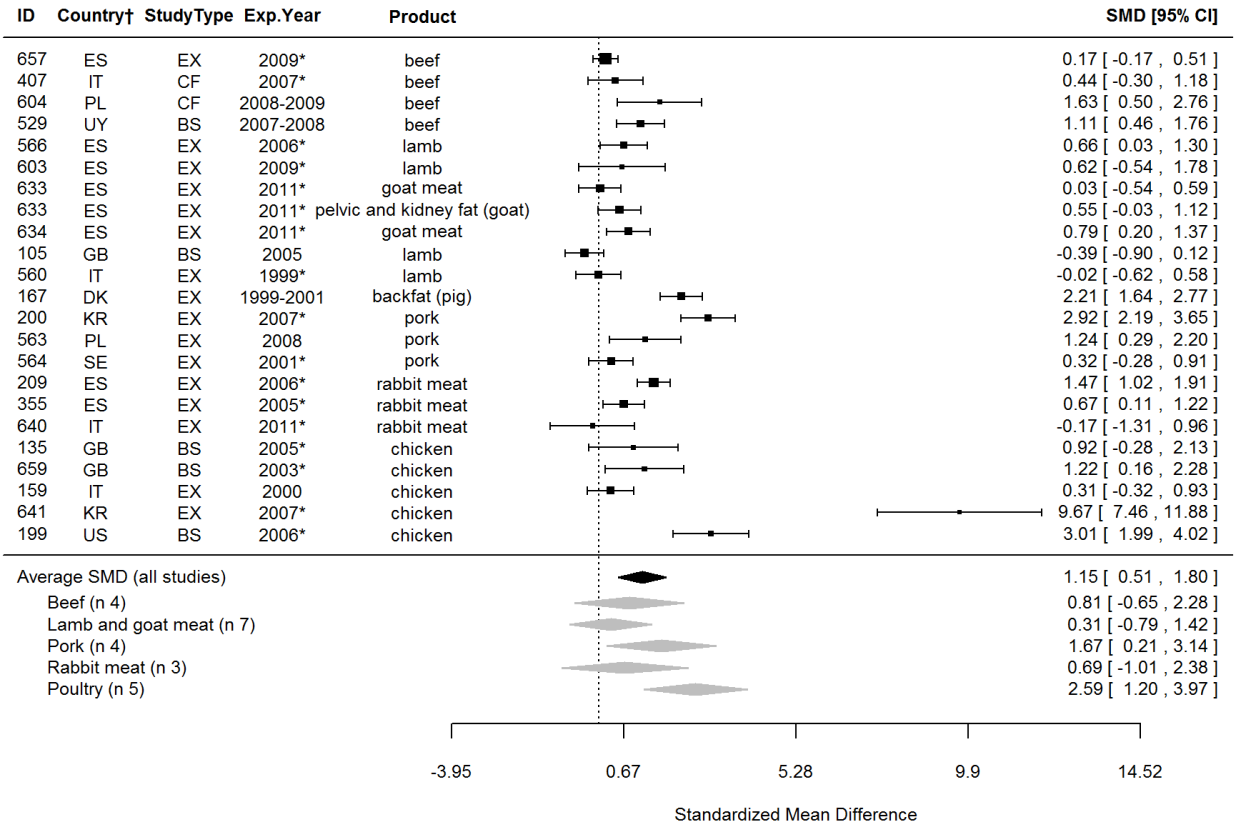


Figure S19. Forest plot showing the results of the comparison of polyunsaturated fatty acids (PUFA) content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

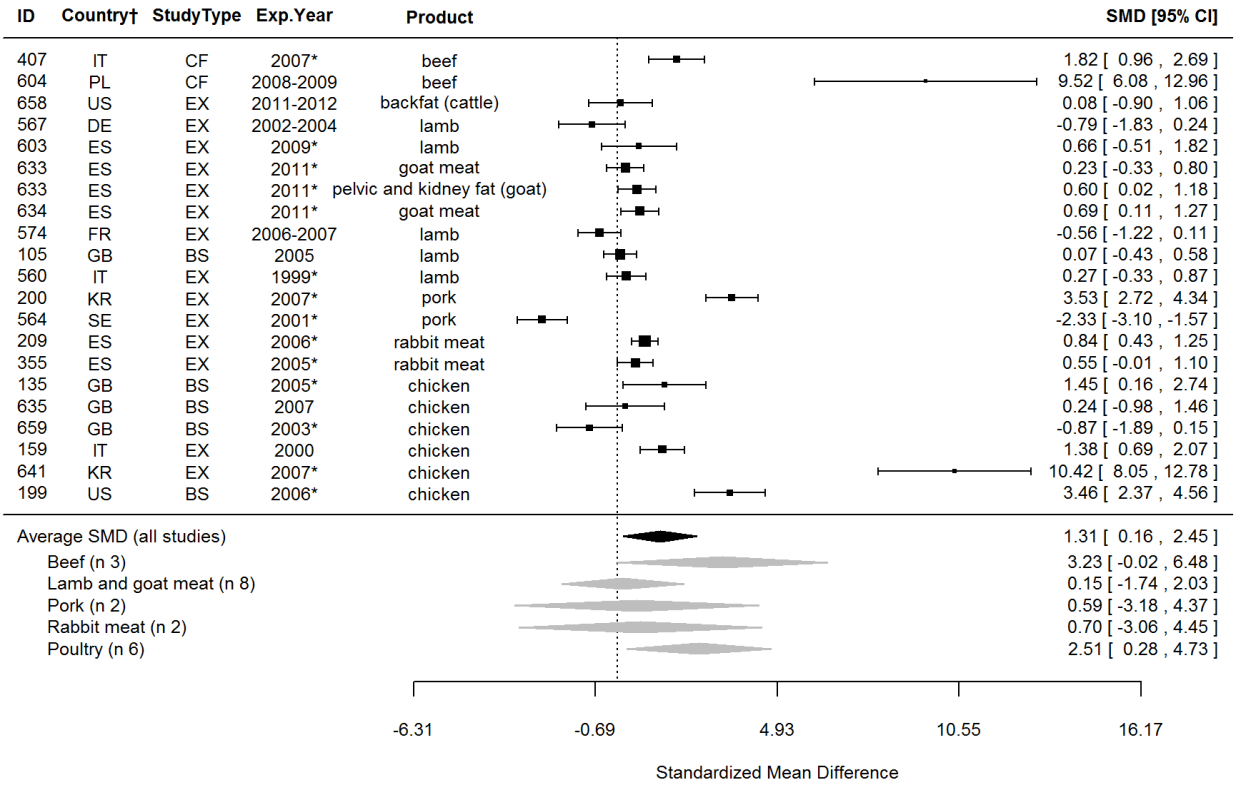


Figure S20. Forest plot showing the results of the comparison of *n*-3 fatty acids content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

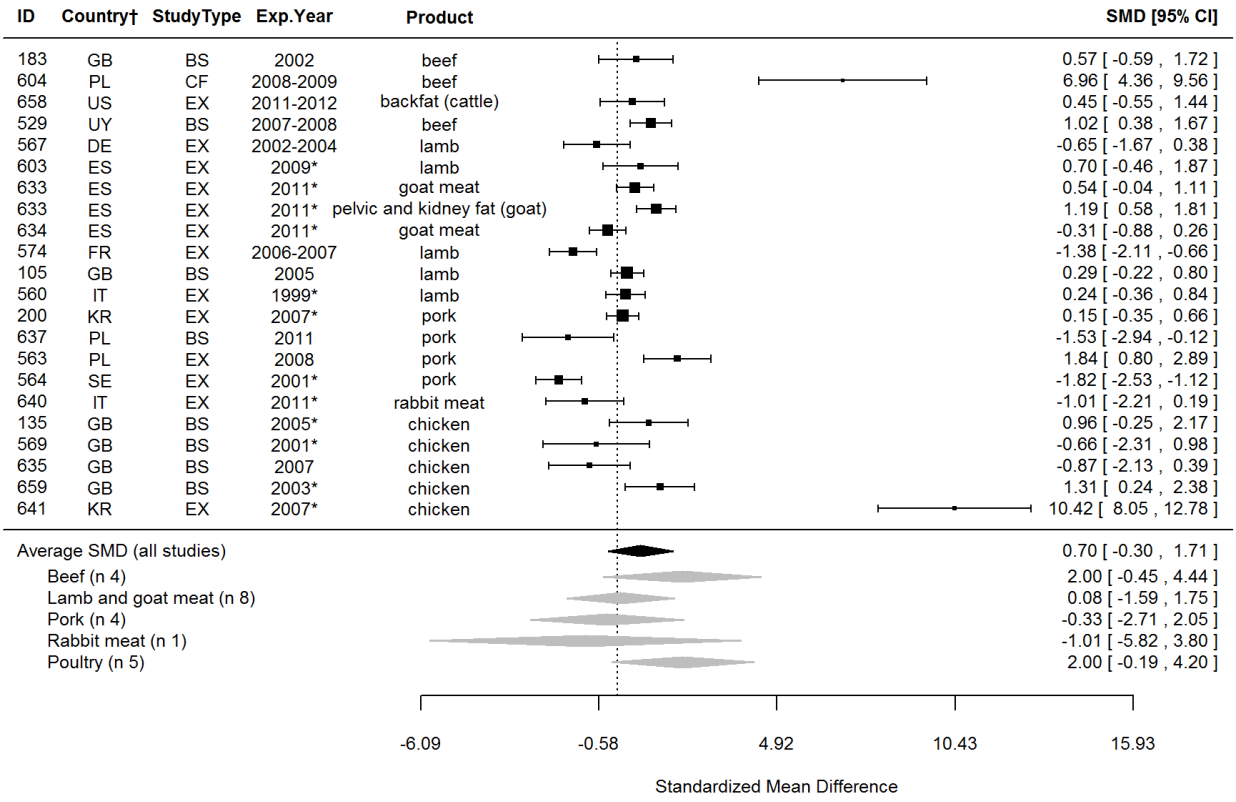


Figure S21. Forest plot showing the results of the comparison of α-linolenic acid (ALA, cis-9,12,15-18:3) content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

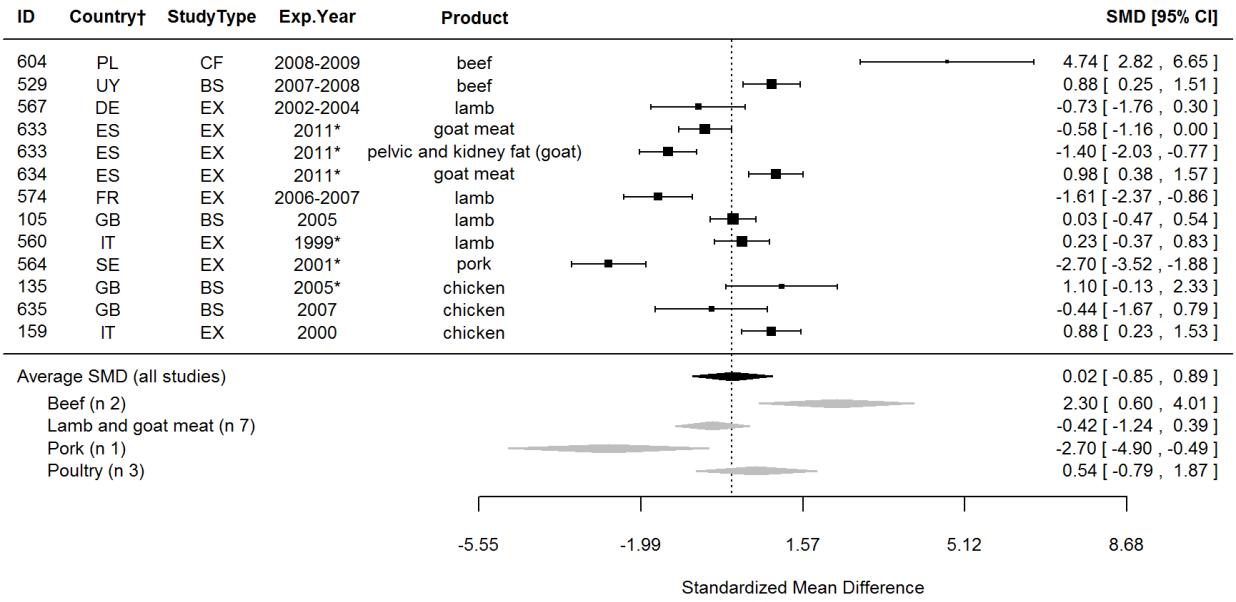


Figure S22. Forest plot showing the results of the comparison of eicosapentaenoic acid (EPA, cis-5,8,11,14,17-20:5) content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

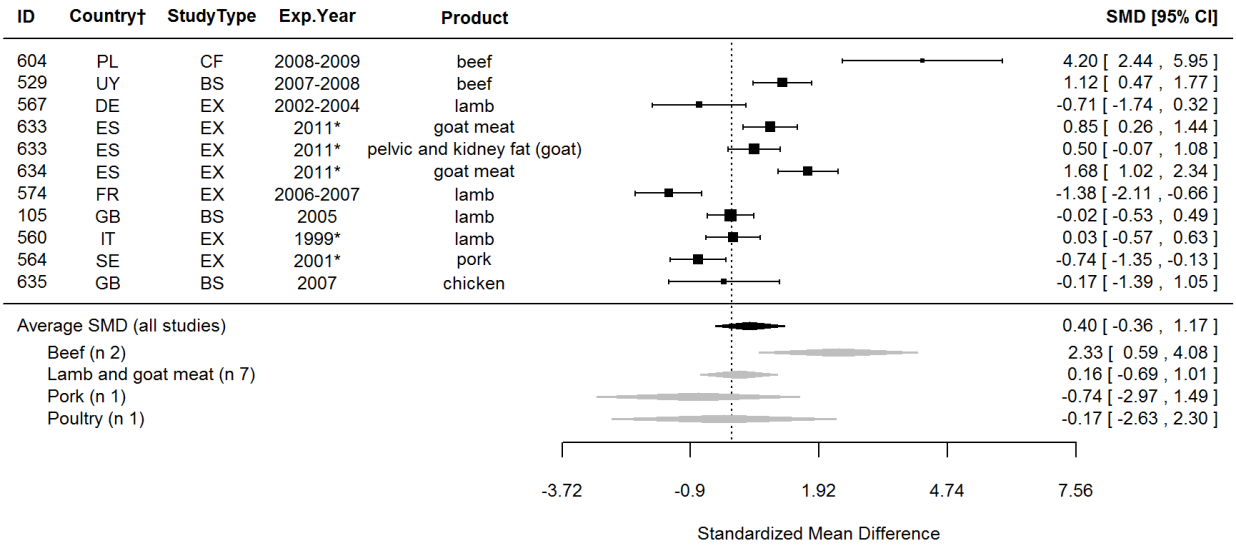


Figure S23. Forest plot showing the results of the comparison of docosapentaenoic acid (DPA, cis-7,10,13,16,19-22:5) content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

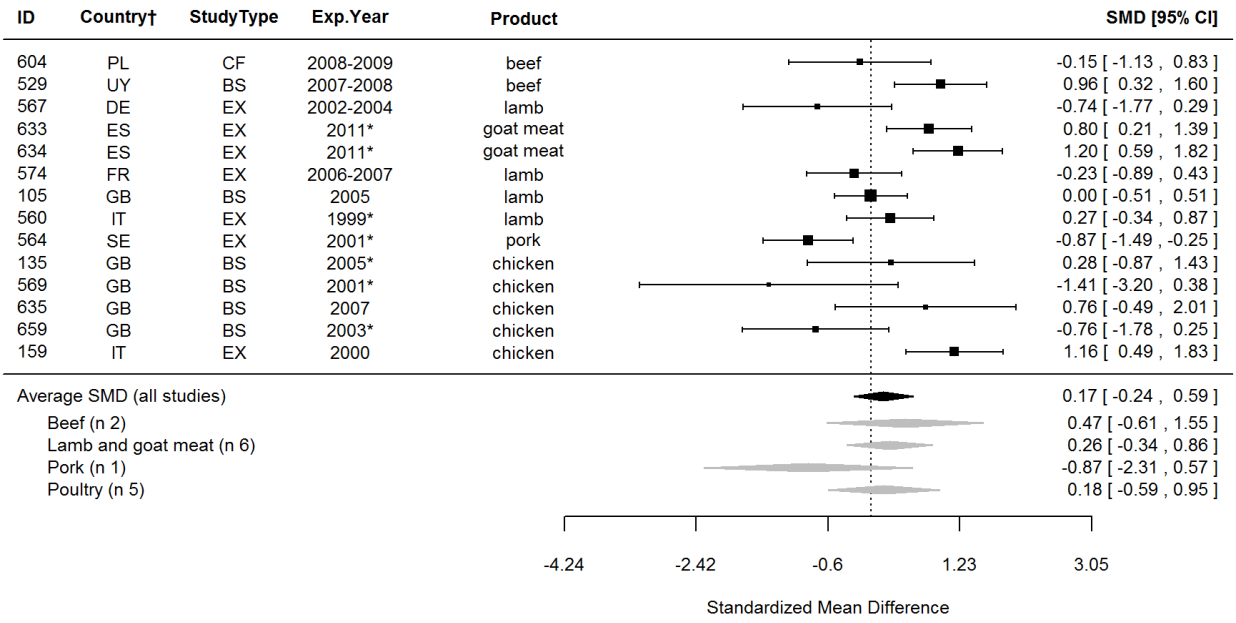


Figure S24. Forest plot showing the results of the comparison of docosahexaenoic acid (DHA, cis-4,7,10,13,16,19-22:6) content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

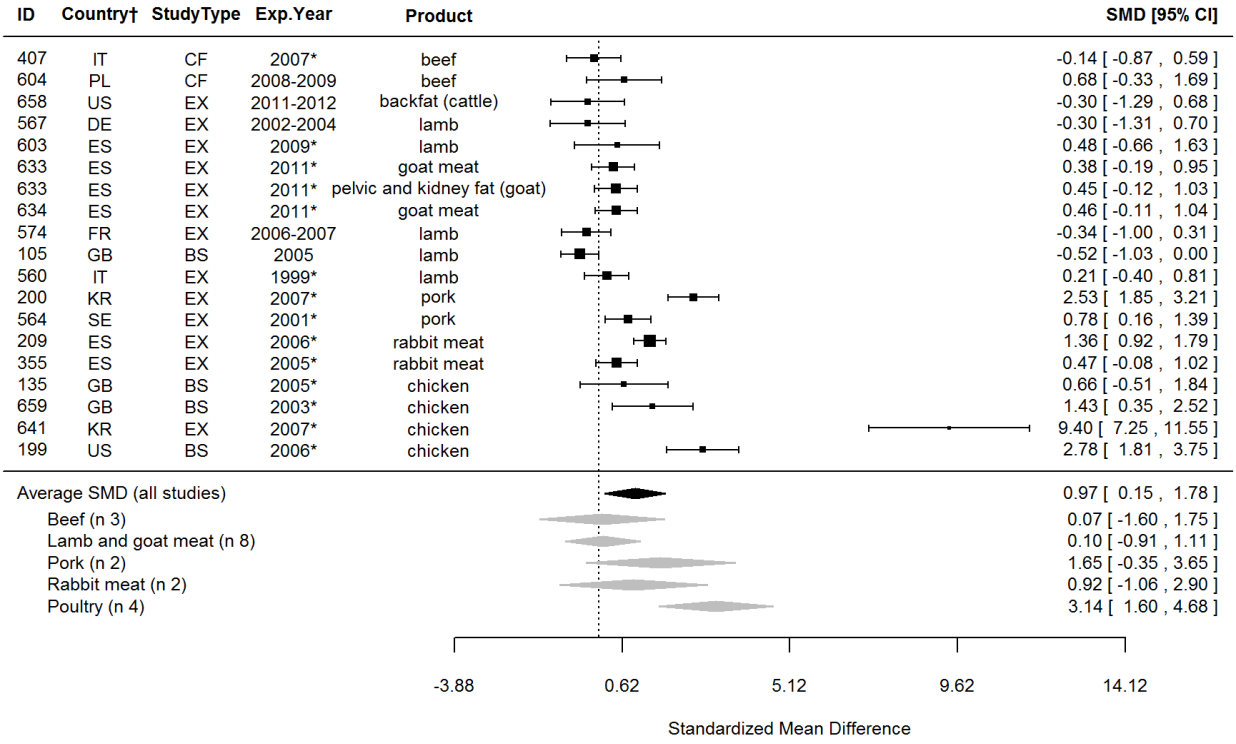


Figure S25. Forest plot showing the results of the comparison of *n*-6 fatty acid content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

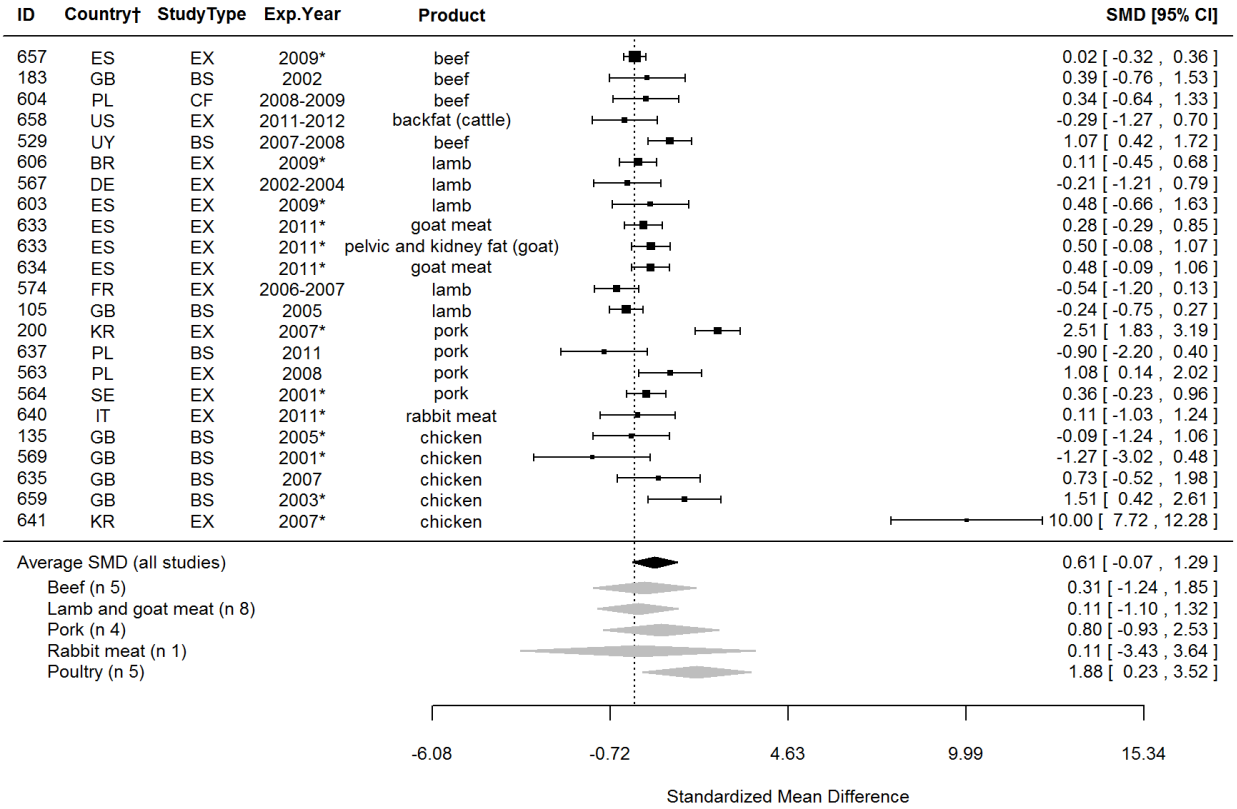


Figure S26. Forest plot showing the results of the comparison of linoleic acid (LA, cis-9,12-18:2) content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

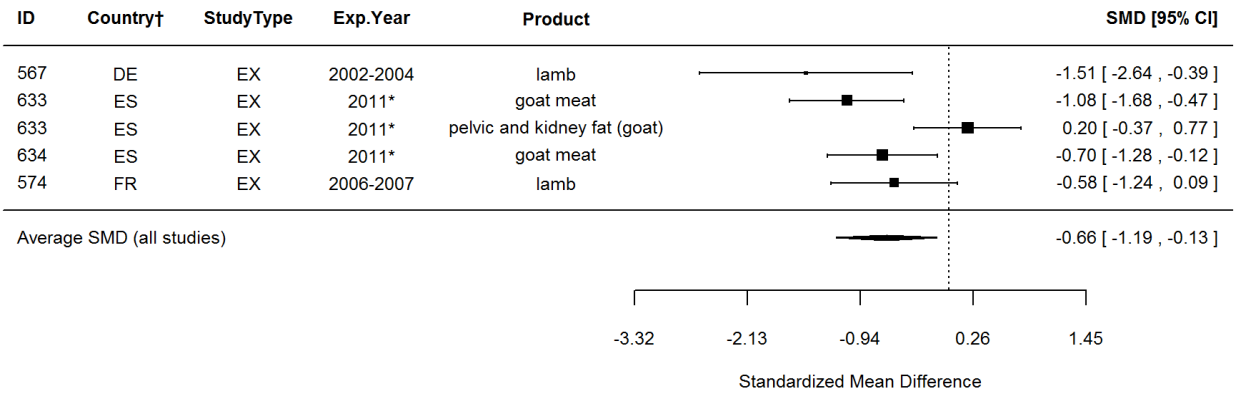


Figure S27. Forest plot showing the results of the comparison of conjugated linoleic acid (CLA, cis-9-trans-11-18:2) content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

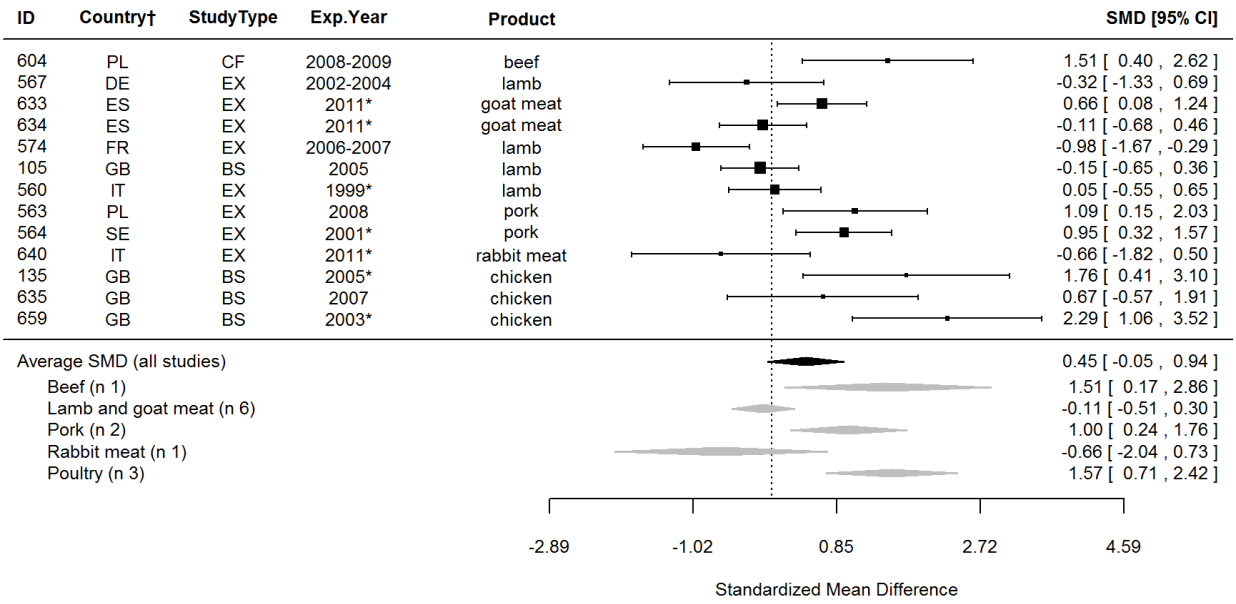


Figure S28. Forest plot showing the results of the comparison of arachidonic acid (AA, cis-5,8,11,14-20:4) content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

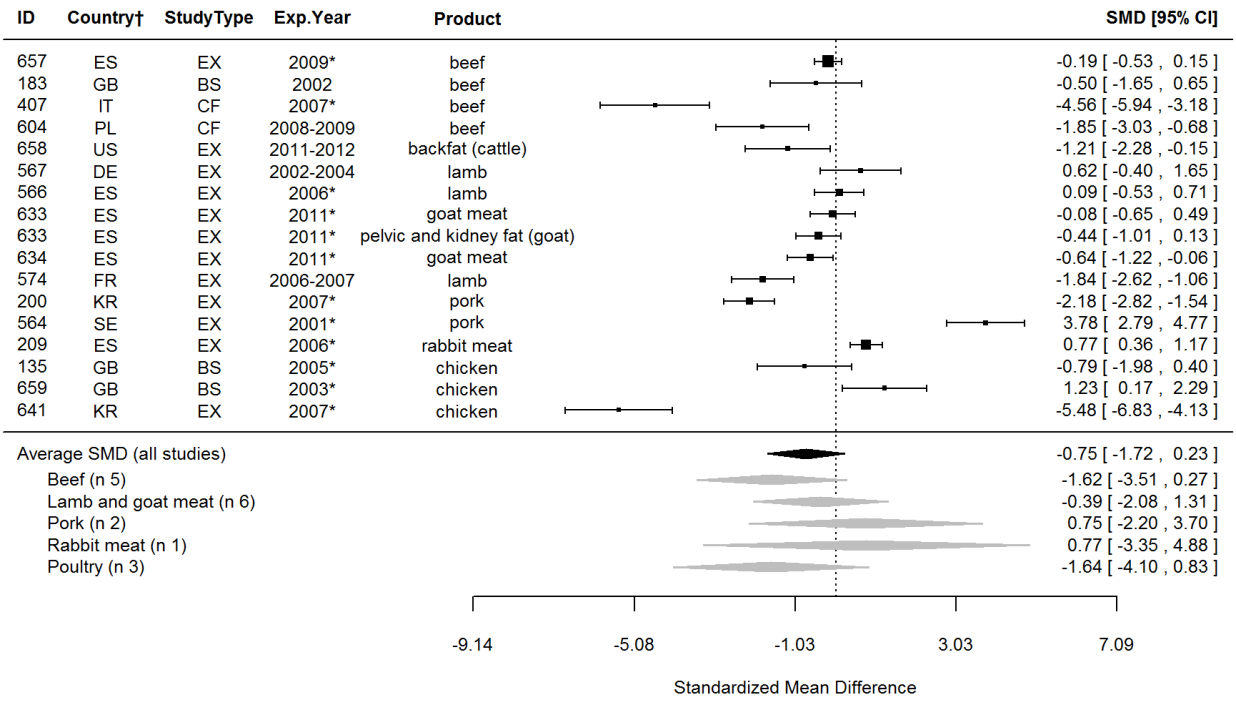


Figure S29. Forest plot showing the results of the comparison of *n*-6/-3 ratio between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

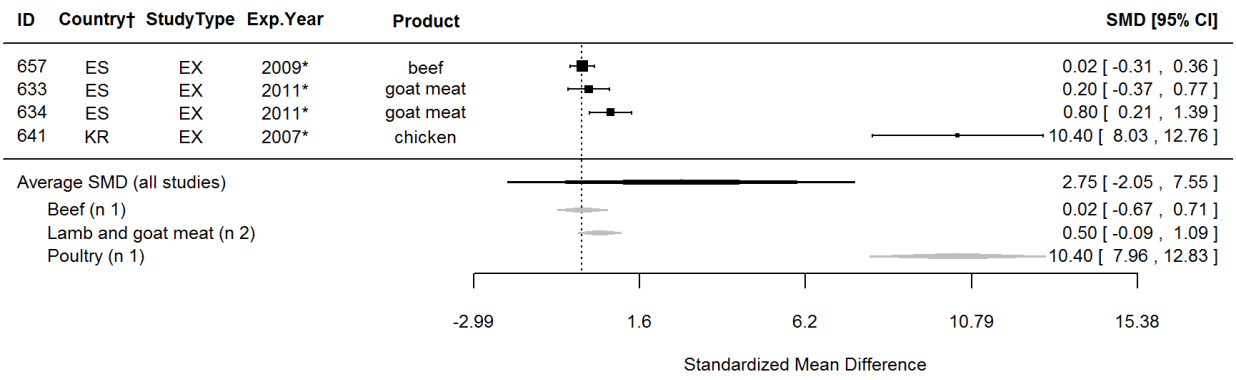


Figure S30. Forest plot showing the results of the comparison of polyunsaturated to saturated fatty acids (PUFA/SFA) ratio between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

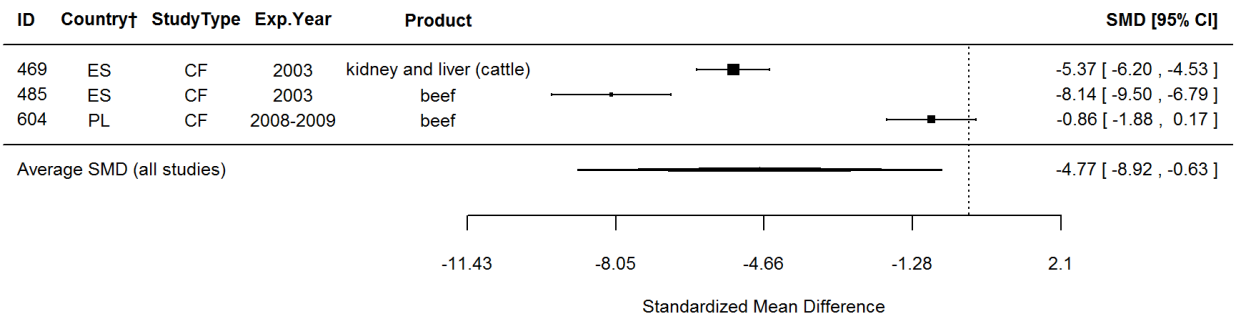


Figure S31. Forest plot showing the results of the comparison of copper (Cu) content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

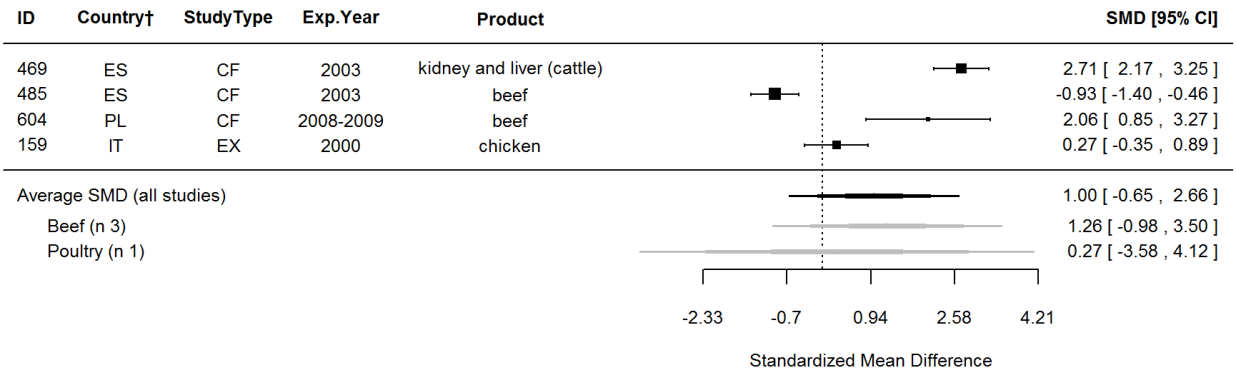


Figure S32. Forest plot showing the results of the comparison of iron (Fe) content between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

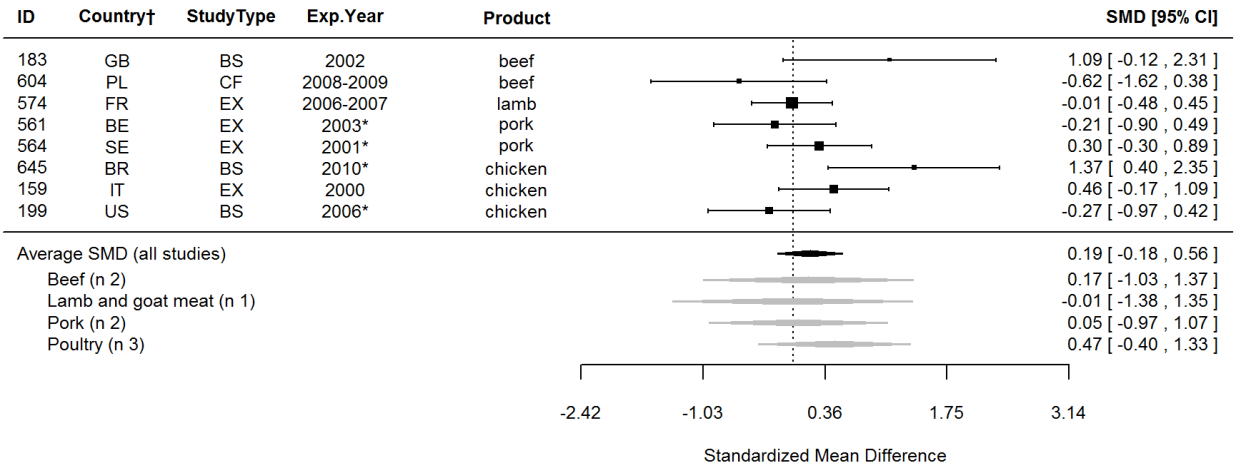


Figure S33. Forest plot showing the results of the comparison of lipid oxidation (TBARS) between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

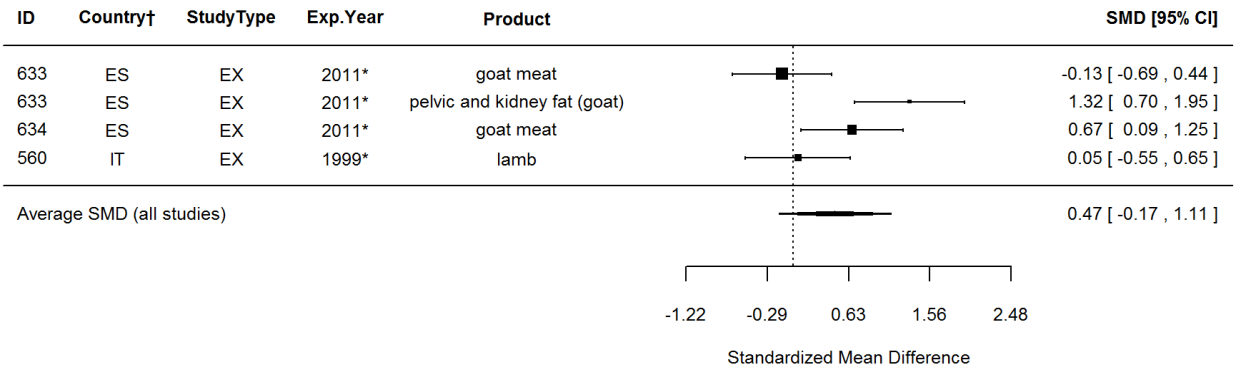


Figure S34. Forest plot showing the results of the comparison of atherogenicity index between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

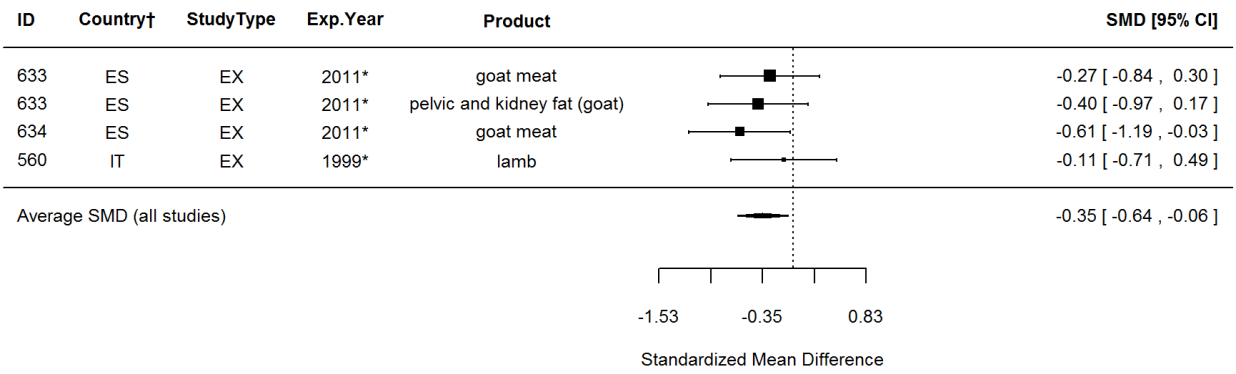


Figure S35. Forest plot showing the results of the comparison of thrombogenicity index between organic and conventional meat using standardised mean differences (SMDs) with 95% confidence intervals, for studies included in standard meta-analysis. The estimated average SMD for all studies and SMDs for different animal groups are indicated at the bottom of the figure. Sign of the SMD indicates if the analysed parameter is higher (+) or lower (-) in organic foods. ID, Paper unique identification number (see supplementary Table S2 for references); CF, comparison of farms, BS, basket study, EX, controlled experiment. *No information about the experimental year (estimated as publication year - 2), †Country codes according ISO 3166-2 (see *http://www.iso.org/iso/home/standards/country_codes.htm*).

Table S12. Results of the standard meta-analysis and sensitivity meta-analysis 1 for parameters where none of the meta-analyses protocols detected significant differences between organic and conventional meat.

	Standard meta-analysis					Sensitivity meta-analysis 1		
Parameter	***n***	**SMD**	**95% CI**	***P****	**Heterogeneity†**	***n***	**Ln ratio‡**	***P****
Major components								
Ash	12	-0.12	-0.83, 0.60	0.750	Yes (91%)	17	4.62	0.353
Dry mass	5	-0.29	-0.78, 0.19	0.238	Yes (56%)	8	4.60	0.229
Water	12	0.22	-0.56, 0.99	0.584	Yes (93%)	16	4.61	0.247
Fatty acids								
10:0 (capric acid)	4	-0.34	-0.84, 0.15	0.169	Yes (38%)	7	4.52	0.154
15:0 (pentadecanoic acid)	10	-0.13	-0.76, 0.50	0.682	Yes (86%)	13	4.56	0.271
17:0 (heptadecanoic acid)	10	0.19	-0.26, 0.64	0.410	Yes (74%)	15	4.58	0.302
18:0 (stearic acid)	24	-0.21		0.116	Yes (67%)	30	4.55	0.124
21:0	3	0.28	-0.63, 1.19	0.543	Yes (80%)	5	4.58	0.444
22:0	-	-	-	-	-	3	5.13	0.247
23:0 (cerotic acid)	-	-	-	-	-	3	4.37	0.496
24:0 (lignoceric acid)	3	0.29	-0.18, 0.77	0.220	No (0%)	3	4.83	0.133
16:1 (palmitoleic acid)	18	-0.10		0.443	Yes (53%)	23	4.55	0.182
16:1 n-7	5	-1.17	-2.48, 0.15	0.081	Yes (92%)	5	4.49	0.220
16:1 n-9	4	0.20	-0.29, 0.70	0.417	Yes (56%)	5	4.67	0.096
18:1 n-7	3	0.18	-0.47, 0.83	0.589	Yes (43%)	3	4.63	0.386
trans-18:1 (total)	3	-0.09	-1.13, 0.94	0.863	Yes (89%)	5	4.52	0.186

n, number of data points included in the comparison; SMD, standardised mean difference of random-effect model; CI, 95% confidence intervals. **P* value <0.05 indicates significance of the difference in composition between organic and conventional meat; †Heterogeneity and the I^2 Statistic; ‡Ln ratio = Ln(ORG/CONV × 100%).

Table S12 cont. Results of the standard meta-analysis and sensitivity meta-analysis 1 for parameters where none of the meta-analyses protocols detected significant differences between organic and conventional meat.

	Standard meta-analysis					Sensitivity meta-analysis 1		
Parameter	***n***	**SMD**	**95% CI**	***P****	**Heterogeneity†**	***n***	**Ln ratio‡**	***P****
trans-18:1 n-9	-	-	-	-	-	3	4.91	0.385
trans-9-18:1	-	-	-	-	-	5	4.51	0.248
VA (trans-11-18:1)	5	-0.19	-0.98, 0.60	0.642	Yes (82%)	7	4.49	0.198
20:1 n-9	-	-	-	-	-	3	3.95	0.125
cis-11-20:1 (eicosenoic acid)	8	-0.16	-0.93, 0.61	0.685	Yes (87%)	9	4.43	0.091
CLA (total)	6	0.39	-0.53, 1.30	0.408	Yes (91%)	7	4.73	0.347
CLA (trans-10-cis-12-18:2)	-	-	-	-	-	4	4.44	0.187
CLA index	3	-0.14	-1.09, 0.80	0.763	Yes (87%)	4	4.60	0.502
20:2	-	-	-	-	-	3	4.49	0.511
cis-11,14-20:2 n-6	4	0.19	-0.92, 1.30	0.739	Yes (91%)	6	4.71	0.208
GLA (cis-6,9,12-18:3)	7	0.02	-0.52, 0.57	0.933	Yes (72%)	9	4.61	0.480
DGLA (cis-8,11,14-20:3)	10	0.07		0.715	Yes (60%)	14	4.54	0.235
ETE (cis-11,14,17-20:3)	4	-0.18	-0.47, 0.10	0.213	No (0%)	10	4.73	0.202
DTA (cis-7,10,13,16-22:4)	9	1.04	-0.14, 2.21	0.083	Yes (96%)	12	4.92	0.204
USFA	6	1.37	-0.29, 3.04	0.106	Yes (97%)	9	4.62	0.187
USFA/SFA ratio	3	0.04	-0.28, 0.37	0.795	No (0%)	4	4.60	0.374
Δ-9 desaturase 16:1/16:0 activity index	3	0.76	-1.44, 2.95	0.499	Yes (97%)	5	5.08	0.500
Δ-9 desaturase 18:1/18:0 activity index§	-	-	-	-	-	4	4.63	0.123
Vitamins and antioxidants								
α-tocopherol (total)	6	1.55	-2.12, 5.22	0.408	Yes (99%)	7	4.46	0.174

n, number of data points included in the comparison; SMD, standardised mean difference of random-effect model; CI, 95% confidence intervals; CLA, conjugated linoleic acids; DGLA, dihomo-γ-linolenic acid; DTA, docosatetraenoic acid; ETE, eicosatrienoic acid; GLA, γ-Linolenic acid; USFA, unsaturated fatty acids; SFA, saturated fatty acids; VA, vaccenic acid. **P* value <0.05 indicates significance of the difference in composition between organic and conventional meat; †Heterogeneity and the I^2 Statistic; ‡Ln ratio = Ln(ORG/CONV × 100%); §Outlying data pairs (where the MPD between ORG and CONV was over fifty times greater than the mean value including the outliers) were removed.

Table S12 cont. Results of the standard meta-analysis and sensitivity meta-analysis 1 for parameters where none of the meta-analyses protocols detected significant differences between organic and conventional meat.

	Standard meta-analysis					Sensitivity meta-analysis 1		
Parameter	***n***	**SMD**	**95% CI**	***P****	**Heterogeneity†**	***n***	**Ln ratio‡**	***P****
Minerals and undesirable metals								
Arsenic (As)	-	-	-	-	-	4	5.76	0.504
Cadmium (Cd)	4	-0.02	-0.54, 0.49	0.928	Yes (75%)	7	4.37	0.076
Iron (Fe) (in haemoglobin)	3	1.04	-0.88, 2.96	0.289	Yes (95%)	3	4.85	0.250
Lead (Pb)	-	-	-	-	-	5	4.39	0.255
Zinc (Zn)	5	0.49	-0.50, 1.48	0.330	Yes (94%)	6	4.68	0.110
Pesticides, mycotoxins and other contaminants								
4-4'-DDD	-	-	-	-	-	3	4.61	1.000
4-4'-DDE	-	-	-	-	-	3	3.71	0.124
4-4'-DDT	-	-	-	-	-	3	4.61	1.000
Aldrin	-	-	-	-	-	3	4.61	1.000
Chlorpyrifos	-	-	-	-	-	3	4.57	0.500
Diazinon	-	-	-	-	-	3	5.26	0.492
Dieldrin	-	-	-	-	-	3	4.61	1.000
Disyston	-	-	-	-	-	3	4.61	1.000
Endrin	-	-	-	-	-	4	4.61	1.000
Ethion	-	-	-	-	-	3	4.61	1.000
Ethyl parathion	-	-	-	-	-	3	4.61	1.000

n, number of data points included in the comparison; SMD, standardised mean difference of random-effect model; CI, 95% confidence intervals; DDD, dichlorodiphenyldichloroethane; DDE, dichlorodiphenyldichloroethylene; DDT, dichlorodiphenyltrichloroethane. **P* value <0.05 indicates significance of the difference in composition between organic and conventional meat; †Heterogeneity and the I^2 Statistic; ‡Ln ratio = Ln(ORG/CONV × 100%).

Table S12 cont. Results of the standard meta-analysis and sensitivity meta-analysis 1 for parameters where none of the meta-analyses protocols detected significant differences between organic and conventional meat.

	Standard meta-analysis					Sensitivity meta-analysis 1		
Parameter	***n***	**SMD**	**95% CI**	***P****	**Heterogeneity†**	***n***	**Ln ratio‡**	***P****
Heptachlor	-	-	-	-	-	3	4.61	1.000
Hexachlorobenzene (HCB)	-	-	-	-	-	4	4.32	0.505
Lindane	-	-	-	-	-	3	4.33	0.499
Malathion	-	-	-	-	-	3	4.61	1.000
Methoxychlor	-	-	-	-	-	3	4.61	1.000
Methyl parathion	-	-	-	-	-	3	3.94	0.503
Mirex	-	-	-	-	-	4	4.61	1.000
Pirimiphos-Me	-	-	-	-	-	3	4.61	1.000
Ronnel	-	-	-	-	-	3	4.57	0.489
Trithion	-	-	-	-	-	3	4.61	1.000
α-benzene hexachloride (α-BHC)	-	-	-	-	-	3	3.70	0.244
β-benzene hexachloride (β-BHC)	-	-	-	-	-	3	4.61	1.000
δ-benzene hexachloride (δ-BHC)	-	-	-	-	-	3	4.61	1.000
Other								
Campylobacter spp.	3	-0.01	-0.23, 0.20	0.892	No (0%)	3	4.64	0.246
pH§	-	-	-	-	-	12	4.61	0.066

n, number of data points included in the comparison; SMD, standardised mean difference of random-effect model; CI, 95% confidence intervals; TBARS, thiobarbituric acid reactive substances method. **P* value <0.05 indicates significance of the difference in composition between organic and conventional meat; †Heterogeneity and the I^2 Statistic; ‡Ln ratio = Ln(ORG/CONV × 100%); §Outlying data pairs (where the MPD between ORG and CONV was over fifty times greater than the mean value including the outliers) were removed.

Table S13. Results of the statistical test for publication bias reported in Table 1 of the main paper.

Parameter	Trim and fill test*		No of missing *n* in Rosenthal's Fail-safe N test†	No of missing *n* in Orwin's Fail-safe N test‡	*P* from Egger's test for funnel plot asymetry§
	No of missing *n*	funnel plot side			
Fat	0	left	199	22	0.079
Intramuscular fat	0	right	3	7	0.186
SFA	0	right	204	26	0.371
12:0 (lauric acid)	2	right	0	11	0.874
14:0 (myristic acid)	0	right	224	23	<0.001
16:0 (palmitic acid)	0	right	174	24	<0.001
MUFA	0	right	1279	24	0.003
OA (cis-9-18:1)	0	right	164	22	0.103
PUFA	0	left	1364	23	<0.001
n-3 FA	0	left	638	21	<0.001
ALA (cis-9,12,15-18:3)	0	left	105	23	<0.001
EPA (cis-5,8,11,14,17-20:5)‖	0	left	0	13	0.038
DPA (cis-7,10,13,16,19-22:5)	0	left	26	11	0.089
DHA (cis-4,7,10,13,16,19-22:6)	1	right	6	14	0.124
VLC n-3 PUFA (EPA+DPA+DHA)¶	-	-	-	-	-
n-6 FA	0	left	519	19	<0.001
LA (cis-9,12-18:2)	0	left	250	24	0.010
AA (cis-5,8,11,14-20:4)‖	0	left	42	13	0.064
LA/ALA ratio¶	-	-	-	-	-
n-6/n-3 ratio	0	right	185	17	0.092

SFA, saturated fatty acids; MUFA, monounsaturated fatty acids; OA, oleic acid; PUFA, polyunsaturated fatty acids; FA, fatty acids; ALA, α-linolenic acid; EPA, eicosapentaenoic acid; DPA, docosapentaenoic acid; DHA, docosahexaenoic acid; VLC n-3 PUFA, very long chain n-3 PUFA; LA, linoleic acid; AA, arachidonic acid. *The method used to estimate the number of data points missing from a meta-analysis due to the suppression of the most extreme results on one side of the funnel plot; †Number of missing data points that need to be retrieved and incorporate in the meta-analysis before the results become nonsignificant; ‡Number of missing data point that need to be retrieved and incorporate in the meta-analysis before the estimated value of the standardised mean (SMD) difference reaches a specified level (here SMD/2); §*P* value <0.05 indicates funnel plot asymmetry; ‖Outlying data pairs (where the MPD between ORG and CONV was over fifty times greater than the mean value including the outliers) were removed; ¶Calculated based on published fatty acids composition data.

4. ADDITIONAL DISCUSSION

4.1. The need to identify alternative approaches to increase VLC n-3 PUFA intake

North American and European agencies currently advise consumers to increase fish and especially oily fish consumption (e.g. salmon and herring) to improve VLC n-3 PUFA intake and thereby reduce the risk of cardiovascular disease[3]. However, implementing these recommendations widely across the human population is thought to be impossible, since most of the world's fish stocks are already over-exploited. Also there are concerns about the sustainability/environmental impacts of fish farming, mercury/dioxin contamination levels in n-3 PUFA rich fish in some regions of the world, while recent studies linked very high DHA intakes from oily fish/fish oil supplements with an increased prostate cancer risk[3-5]. It is therefore thought essential to develop alternative strategies to increase VLC n-3 PUFA intakes (e.g. increasing VLC n-3 PUFA concentrations in meat, consumption of algae with high VLC n-3 PUFA content).

4.2. The need to carry out additional studies comparing the mineral composition of meat from organic and conventional production

Due to the very limited evidence base it is not currently possible to estimate differences in mineral composition and potential impacts on human health. Additional well designed studies are therefore required to confirm trends identified in this study.

If the trend towards higher iron (Fe) concentration in organic meat (especially liver) were to be confirmed in future studies this could be nutritionally relevant/desirable, since iron deficiency anaemia remains a problem in reproductively active woman worldwide[6]. Meat (especially red meat and organs such as liver) is known to be an important dietary source for Fe, and Fe from most animal sources (haem iron) is more readily absorbed than Fe from plant sources of food (non-haem iron)[7].

However, if future studies confirm that there is an approx. 25% lower copper intake with organic meat this is unlikely to have a significant health impact, since (1) estimated dietary Cu intakes in Europe (1.0-2.3 mg/day for males and 0.9-1.8 mg/day for females[8] are slightly above the recommended intakes for adults (0.9 mg/day)[9], (2) most Cu intake is with crop based foods such as cereals, vegetables and potatoes[10] and (3) no significant differences in Cu-concentrations between organic and conventional crops were detected in a previous literature review/meta-analysis[1]. However, recent studies suggest that the incidence of chronic diseases (e.g. Alzheimer's disease, ischemic heart disease and osteoporosis) associated with insufficient Cu-intakes may be underestimated[11].

5. ADDITIONAL REFERENCES

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