



Review: International trade in animal products and the place of the European Union: main trends over the last 20 years

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1 **Review: International trade in animal products and the place of the European**
2 **Union: main trends over the last 20 years**

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6

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8

9 **Abstract**

10 This article presents an analysis of the evolution of international trade in animal
11 products over the period 2000 to 2018, using customs data from the "BACI" database.
12 Firstly, this article presents the evolution of global trade in animal products for the top
13 five exporting countries (in decreasing order: the European Union (EU), the United
14 States, New Zealand, Brazil and Australia) and then for the two largest importers
15 (China and Japan). It then looks at the world trade situation for four major animal
16 products: poultry meat, pigmeat, beef and dairy products. Animal products account for
17 16% of world agro-food trade; this rate has remained fairly stable throughout the
18 period. The growing imbalance between supply and demand for animal products in
19 Asian countries, particularly in China, is stimulating international trade to the benefit of
20 the major exporting countries. The EU is the world's leading exporter of animal
21 products (with 21% of the total in 2018) and the fourth importer (with 6% of the total).
22 It is in surplus in dairy products and pigmeat, but in deficit (in value) in beef and poultry
23 meat. Dairy products, which are exported by very few countries (mainly the EU, New
24 Zealand and the United States), account for almost a third of all trade in animal

25 products. They are thus ahead of beef (23%), pork (12%) and poultry meat (12%).
26 Trade in live animals remains low (5%).

27

28 **Keywords:** Globalisation, Competitiveness, Trade agreements, Dairy products, meat

29

30 **Implications**

31 World trade in animal products is growing, mainly due to an increase in the
32 consumption of animal proteins in Asian countries and their difficulties to develop their
33 domestic supply. This situation opens trade opportunities for the major exporting
34 countries, including the European Union (EU), in dairy products and pigmeat. There
35 are also opportunities for EU beef exports, especially to Asia for niche markets (high
36 quality cuts) and also offals (due to high sanitary standards). The EU has little or no
37 success in exporting meat (beef, poultry), especially from quality chains. In many
38 importing countries, particularly developing countries (including Asia and Africa), the
39 search for low-cost products remains the preferred strategy.

40

41 **Introduction**

42 International trade in agri-food goods has grown significantly in the past fifty years,
43 both in volume and value (Pouch, 2015; World Trade Organization, 2020).
44 Technological innovations, the dissemination of knowledge and the considerable
45 progress made in terms of infrastructure, logistics and storage conditions have
46 favoured this development, in a context characterised by the increasing openness of
47 economies (Thompson-Lipponen and Greenville, 2019), the development of
48 transnational firms and a demographic boom (Centre d'Etudes et de Prospective,
49 2017 ; United Nations, 2019). While world trade in agro-food goods is developing over

50 the long term, there have been periods when trade has declined, such as during the
51 2009 financial crisis or the more recent Covid19 crisis. In 2020, World Trade
52 Organization experts estimate that world trade in goods could drop from 13% (most
53 optimistic scenario) to 32% (most pessimistic scenario), while the decline should be
54 smaller for agri-food goods, which are basic necessities.

55 In 2018, agricultural and agri-food products will account for 8% of world merchandise
56 trade. This relative share has fallen sharply over the decades due to a more rapid
57 development of trade in other sectors. In constant currency, world exports of agro-food
58 products have increased sevenfold in 50 years, corresponding to an average annual
59 growth rate of 3.8% (Claquin, 2017). The increase in agri-food trade allowed to provide
60 ever more consumers with more abundant, more varied and often less expensive food.
61 Over time, trade has evolved towards more elaborate, more processed products
62 whose prices are higher than the corresponding raw products.

63 The objective of this article is to look at the main trends at work in the international
64 trade of animal products, in terms of imports, exports and balance of trade. The term
65 "animal products" here covers all animal species and all products (raw and processed)
66 derived from them (meat, milk and all other animal products). This analysis is based
67 on statistical data from customs. More precisely, these data issue from the "BACI"
68 database developed by the CEPII (*Centre français d'étude et de recherche en*
69 *économie internationale - CEPII*), based on primary data from the COMTRADE
70 database produced by the United Nations Statistics Division (*Centre français d'étude*
71 *et de recherche en économie internationale*, 2010). The data cover the period 2000 to
72 2018 (a long-term trajectories). As the last available year is 2018, they do not, however,
73 allow to analyse the effects of the current coronavirus crisis.

74 This article is structured in two parts. The first part presents the evolution of
75 international trade in animal products, focusing on the case of the top five exporting
76 countries (European Union – EU -, the United States, New Zealand, Brazil, Australia)
77 and the top two importing countries (China and Japan). Statistical elements are
78 provided in the tables and figures for other countries, but due to lack of space, these
79 cannot be analysed specifically. The seven selected countries account for 67% of
80 world exports of animal products and 44% of world imports. The second part presents
81 a synthetic analysis of the main trade trajectories in four sectors, namely poultry meat,
82 pigmeat, beef and dairy products.

83

84 **The main countries contributing to world trade in animal products**

85 At the international level, and in a fairly stable manner throughout the period studied
86 (2000 to 2018), animal products accounted for 16% of total agri-food trade. In the
87 following analysis, trade with all countries is considered, excluding intra-EU trade. This
88 weight varies from one country to another depending mainly on the characteristics of
89 the natural environment (cultivable or not) and the productive orientation of the
90 territories. It reaches particularly high levels in New Zealand (69%), Uruguay (68%)
91 and Australia (44%). Closer to the world average in the EU (23%), Brazil (19%) and
92 the United States (19%), it is much lower in other countries such as China (10%),
93 Russia (4%) and Africa (3%).

94 International trade in animal products has risen from €56 billion in 2000 to €152 billion
95 in 2018 (in current currency), with an acceleration since 2009. To facilitate the
96 appropriation of the results and limit the amount of information, the data for the period
97 2010 to 2018 are presented in three aggregates in the following analysis: the annual
98 average for the period 2000 to 2009; the annual average for the period 2010-2017 (i.e.

99 just after the financial crisis of 2009); the latest available data for 2018. Thus, between
100 the average of 2000-09 and 2018, world trade in animal products has increased 2.4
101 times. This coefficient is close for dairy products, pigmeat and poultry meat; it is higher
102 for eggs (2.9) and beef (2.7) and lower for live sheep/goats (1.6) and live pigs (0.9).
103 World trade in animal products is dominated by a few large private multinational
104 companies or very large cooperatives. These well-known companies include JBS,
105 Tyson Foods, Cargill, Dairy Farmers of America, Smithfield, Fonterra, Nestlé, Lactalis,
106 Arla, Campina-Friesland, Yili, Danish Crown, Vion, Saputo, Brazilian Meat Producers
107 or Marfrig.

108 Trade in animal products is increasingly oriented towards elaborated, transformed and
109 assembled products (finished products for consumers or ingredient products for the
110 agro-food industries). Products are increasingly "cracked" and reassembled, which
111 gives rise to complex trade flows. This cracking of products concerns both milk
112 (separation of the different components), meat (separation and boning of parts) and
113 eggs. As an illustration of this expansion of the processed meat trade, note the growing
114 share now taken by of "individual ready meals" with animal ingredients, made possible
115 by the wide adoption of Individual Quick Freezing technology. An advantages of this
116 method is that the freezing process takes only a few minutes. This prevents the
117 formation of large ice crystals in the product's cells, which can destroy the membrane
118 structures at the molecular level. The product thus keep its shape, colour, smell and
119 taste after defrosting.

120 In 2018, international trade in animal products (in value) is composed of 52% meat,
121 32% dairy products, 5% live animals and 11% other animal products (Figure 1).
122 Although trade in live animals is frequent between neighbouring countries, it remains

123 more complex to organise over long distances and, moreover, gives rise to some
124 criticism from many citizens who are increasingly concerned about animal welfare.
125 World trade in animal products is geographically concentrated. The top ten exporting
126 countries will account for 80% of exports in 2018. These are, in descending order, the
127 EU (22% of the world total), the United States (15%), New Zealand (10%), Brazil (9%),
128 Australia (8%), Canada (4%), China (4%), Thailand (3%), India (3%) and Argentina
129 (2%). The top ten importing countries account for 61% of world imports. In 2018, China
130 will be the largest importer (17% of the total), followed by Japan (9%), the United States
131 (9%), the EU (6%), South Korea (4%) and Mexico (4%). The next five countries,
132 Vietnam, Russia, Canada, Saudi Arabia and the United Arab Emirates, each account
133 for around 3% of world imports. An analysis of the trade trajectories for the main
134 countries involved in exports and imports of animal products is carried out below.

135

136 ***The European Union***

137 The EU is the world's leading exporter of animal products (€32.4 billion in 2018, i.e.
138 23% of total agri-food exports). Although European agriculture is less endowed in
139 agricultural surface area (178 million hectares, 60% of which is arable land) than other
140 studied countries (United States, Brazil, etc.), yields per hectare are higher due to a
141 high agronomic potential and an often favourable climate. Livestock productions, which
142 are unevenly distributed among member states (Roguet et al., 2015), account for about
143 40% of final agricultural production in the EU. It is mainly the result of smaller family
144 farms than in most other competitor countries. Within the EU, however, production
145 models are very heterogeneous from one area to another (Hercule et al., 2017),
146 depending on land availability (which requires more or less intensification), relief (in
147 some countries mountain areas contribute significantly to livestock farming activities),

148 the agronomic potential of the soils (arable or not), the availability of labour, or
149 economic organisation (more or less vertical integration). The development of
150 European livestock activities has long been encouraged by the Common Agricultural
151 Policy. Although successive reforms have profoundly modified the way in which public
152 support is allocated to the agricultural sector (gradual convergence of European prices
153 on world prices, abandonment of export refunds, limitation of recourse to public
154 storage, etc.), subsidies still represent today a significant part of the income of very
155 large number of European livestock farmers (Guyomard and Détang-Dessendre,
156 2020). Nevertheless, for European farms specializing in monogastric production, the
157 level of subsidies is historically much lower than for dairy and beef farms.

158 The EU was in surplus in several animal products since the end of the 1970s, with the
159 notable exception of sheepmeat. The EU is currently the world leader in terms of trade
160 balance in animal products, with €23 billion in 2018 compared to €6.5 billion in 2000-
161 09 (Table 1). This positive development is due to a combination of several factors: a
162 levelling off of domestic consumption of animal proteins; a significant improvement in
163 the balance in the dairy (particularly since the end of milk quotas in 2015, which has
164 led to an increase in European milk production) and pigmeat sectors (African swine
165 fever has led to a rapid increase in pigmeat imports by China); several importing
166 countries, including Japan, trust in the quality and food safety of European products.

167 In 2018, the EU is in surplus in dairy products (€15.4 billion) and pigmeat (€7.2 billion),
168 but in deficit in beef (-€807 million) and poultry meat (-€497 million). However, this EU
169 trade surplus in animal products is made possible by significant imports of plant
170 proteins, mainly from the American continent (Brazil and the United States). Thus, in
171 2018, for example, European imports amount to €6.1 billion for soya meal and €4.8
172 billion for soya beans.

173 Exports account for around 12% of European milk production, 14% of pigmeat, 10%
174 of poultry meat and 5% of beef (European Commission, 2019). EU exports of animal
175 products are mainly dairy products (52% of the total in 2018) and pigmeat (22%).
176 Exports of poultry meat (5%), live cattle (4%) and beef (4%) are less developed, mainly
177 due to higher prices than those of competitors. The evolution of the parity between the
178 different currencies has an impact on the EU's ability to market (or not) its products
179 internationally. For example, the Brazilian real and the Argentine peso have fallen
180 against the Euro. Both countries have been undergoing continuous currency
181 devaluations for ten years, giving them an export advantage. On the other hand, the
182 euro to US dollar has changed significantly over the period, from 0.86 in January 2002,
183 to 1.57 in July 2008, 1.07 in January 2017 and 1.21 in December 2020.

184 A little over two thirds of EU exports in animal products are destined to no more 15
185 countries. China has become the EU's biggest customer (European Commission,
186 2016), with imports increasing tenfold between 2000-09 and 2018 (€7.8 billion). Thus,
187 this country alone will account for 24% of EU exports in animal products in 2018. This
188 rate is 31% for pigmeat, 26% for dairy products, 12% for poultry meat and 17% for
189 beef. The EU will provide 30% of China's supplies (by value) of animal products in
190 2018, compared with 22% in the period 2000-09. Far behind China, the United States
191 are the EU's second largest customer in terms of animal products, accounting for 8%
192 of total European exports. From €1.4 billion between 2000-09, they rose to €2.5 billion
193 in 2018, of which 55% were dairy products and 23% pigmeat. Japan ranks third (7%
194 of EU exports) due mainly to its imports of pigmeat (65% of purchases) and dairy
195 products (26%). Behind this top trio, the following countries are Switzerland, South
196 Korea, Saudi Arabia, Turkey, Algeria, the Philippines and Australia. Russia, which has

197 long occupied an important place in European exports, is now ranking behind these
198 countries (Chatellier et al., 2018; Smutka et al., 2019; Cheptea and Gaigné, 2020).
199 EU imports of animal products increased slightly over the under review period. Indeed,
200 they rose from €7.2 billion in 2000-09 to €9.4 billion in 2018. Several factors explain
201 this evolution: the demographic stability of the EU; the decline in individual
202 consumption of animal proteins for a large number of Europeans; the recent
203 development of animal productions in several Member States, especially Spain,
204 Germany, the Netherlands and Poland (but not France); and, the EU's quality import
205 requirements (health and environmental standards). A large proportion of European
206 imports of animal products are subject to zero or reduced duty import quotas under the
207 World Trade Organization agreements. They mainly concern poultry meat (23% of the
208 total in 2018, 47% from Thailand and 30% from Brazil) and beef (21% of the total, 29%
209 from Brazil, 22% from Argentina and 16% from Uruguay). Imports of dairy products are
210 modest (16% of the total from Switzerland (63%) and New Zealand (11%)) and account
211 for about 1% of domestic consumption. While imports are practically nil in the pig
212 sector, they account for about 5% of domestic consumption of poultry and pig meat
213 and almost 20% of sheep meat. For the latter, 85% is purchased from New Zealand
214 and 10% from Australia.

215

216 ***The United States***

217 With an agricultural area more than twice that of the EU (408 million hectares, including
218 155 million hectares of arable land), the US are the world leader in terms of agricultural
219 production. In addition to grain maize and soya, they are heavily involved in poultry,
220 beef and milk production (USDA-a, 2020). More than in other competitor countries,
221 including Australia, New Zealand and Brazil, US livestock productions benefit from

222 budgetary support through the Farm Bill (Winders, 2020). In terms of trade, the North
223 American Free Trade Agreement (NAFTA), which came into force in 1994, has
224 favoured trade between the three signatory countries of the United States, Mexico and
225 Canada.

226 US exports of animal products amount to €23.5 billion in 2018 (second in the world
227 behind the EU), or 17% of agri-food exports. They are fairly balanced between the
228 different production sectors: 29% for beef, 24% for pork, 20% for dairy products and
229 15% for poultry meat. In proportion to domestic production, exports represent 10% of
230 milk, 12% of beef, 17% of poultry meat and 21% of pig meat. Exports go first to the
231 other two NAFTA member states (20% to Mexico and 13% to Canada), then to Japan
232 (15%), China (11%) and South Korea (10%). Note that it is still too early to measure
233 how the Phase One Deal (USDA-b, 2020) could have an impact on future US exports
234 of animal products to China (Jean, 2020).

235 The United States rank third in the world, behind China and Japan, in imports of animal
236 products (€14.1 billion in 2018). These mainly come from Canada (27%), the EU (18%)
237 and Mexico (14%). They mainly concern beef and veal (35%, of which 0.7% from the
238 EU), dairy products (20%, of which 49% from the EU) and pigmeat (10%, of which 39%
239 from the EU).

240 Overall, the United States record a positive trade balance in animal products (€9.4
241 billion in 2018), thanks mainly to bilateral relations with Japan (+€3.4 billion), Mexico
242 (+€2.6 billion) and China (+€2.3 billion). This positive balance is mainly due to the pork
243 (+€4.1 billion) and poultry (+€3.0 billion) sectors. The situation is also positive in beef
244 and veal (+€1.9 billion) and in the dairy sector (+€1.9 billion), where cross-flows
245 between imports and exports are significant (Table 2).

246 The EU enjoys a positive balance with the United States in terms of animal products
247 (€1.8 billion in 2018 compared with €900 million over the 2000-09 period). This surplus
248 is mainly due to dairy products (€1.3 billion, mainly cheeses) and pigmeat (€570
249 million). The EU's trade relations with the United States have been the subject of
250 negotiations for many years, following on from the project for a "transatlantic trade and
251 investment partnership". This draft free trade agreement, whose negotiations were
252 suspended at the end of 2016 following opposition from President Donald Trump, aims
253 to develop a common market by tackling the obstacles, both tariff and non-tariff, that
254 exist between the two partners. It mainly aims to reduce customs duties, to further
255 harmonise regulatory standards between the two partners and to strengthen
256 cooperation in the formulation of international standards. In April 2019, the EU Council
257 instructed the European Commission to relaunch negotiations for a new trade
258 agreement with the United States, despite France's opposition. The new agreement, if
259 concluded, would, however, be more limited than Transatlantic Trade and Investment
260 Partnership was intended to be, as it would not apply to agricultural products or
261 government procurement. However, the US has announced that it wants agriculture to
262 be included in the agreement (Johnson and Schwarzenberg, 2020).

263

264 ***New Zealand***

265 Despite a particularly small agricultural area (11.6 million hectares), New Zealand
266 occupies an important place in the international trade of animal products. In this
267 country, where grassland occupies almost 90% of the agricultural surface area,
268 agricultural production is dominated by the dairy and sheep sectors. Because of a small
269 domestic market (4.7 million inhabitants) and thanks to a political and economic
270 organisation that has long been outward-looking, the country ranks second in the world

271 in terms of trade balance for animal products: €14.4 billion in 2018, with a doubling of
272 this amount in current currency compared to the period 2000-09.

273 New Zealand's exports in animal products (€15 billion in 2018), which represent 70%
274 of agri-food exports, are 65% dairy products, 14% beef (including cull dairy cows,
275 frozen raw material for mince, calves, etc.) and 15% sheep meat. New Zealand's main
276 customers for livestock products are China (31% of the total in 2018), the United States
277 (10%), the EU (8%), Australia (6%) and Japan (4%). Exports to China have increased
278 considerably, from €434 million in 2000-09 to €4.7 billion in 2018.

279 New Zealand exports more than 90% of its domestic milk production and 80% of its
280 beef production. Boosted by increased purchases from China, dairy exports are mainly
281 whole milk powder and butter, while cheese exports are more reduced, as are exports
282 of infant milk powder, offering development opportunities for the EU. New Zealand is
283 the world's largest exporter of dairy products in volume (in milk equivalent) and second
284 in value (behind the EU). This position is due to several factors: an abundance of high-
285 quality grassland; abundant water resources; a high concentration of industrial
286 facilities, with a single company (the Fonterra cooperative) providing most of the
287 marketing; and the willingness of political and economic players to boost exports. After
288 a very strong growth in milk production between 2000 and 2015, a slowdown in the
289 dynamics of supply has however been observed since then, in a societal context where
290 the damage caused to the environment by dairy farming (high use of irrigation water,
291 levels of fertilisation, etc.), particularly in the South Island, has led to local disputes
292 (Institut de l'Elevage, 2017; Ratnayake, 2019).

293 New Zealand's imports in animal products are very low (€588 million in 2018). Its main
294 suppliers are the EU (37%), Australia (27%) and the United States (18%). New Zealand
295 is a serious competitor to the EU in the international market, but trade relations

296 between the two areas are unbalanced (European Commission, 2020-a). Indeed, New
297 Zealand represents 0.6% of the EU's export for animal products, but 14% of its import.
298 However, the EU's deficit with New Zealand (-€1.1 billion in 2018, of which -€882
299 million for sheepmeat) is less than in the past (-€1.3 billion in 2000-09) for two reasons:
300 this country has benefited from trade opportunities following the opening of the
301 Chinese market; the EU's needs in sheepmeat are decreasing in parallel with the
302 decline in consumption. In this context, it is not certain that the signing of a free trade
303 agreement between the EU and New Zealand (negotiations started in June 2018) will
304 lead to profound changes in these trade flows; the exit of the United Kingdom from the
305 EU will, however, have an influence insofar as this country has historically had
306 privileged relations with New Zealand (Saunders et al., 2020).

307

308 ***Brazil***

309 Thanks to its 240 million hectares of usable agricultural area and the efforts made to
310 modernise its agri-food complex, Brazil is one of the world's leading agricultural
311 producers (Buainain et al., 2019). The country stands out for its performance in the
312 production of sugar, orange juice, soya, ethanol, but also beef (Brazilian Beef
313 Exporters Association, 2020) and poultry meat (OECD-FAO, 2015). This situation
314 should not obscure the existence of controversies concerning the duality of the forms
315 of agriculture prevailing in this country (farms dedicated to export versus small family
316 structures oriented towards the domestic market); the strong inequalities in access to
317 land; the lack of transport infrastructures in the remote areas (notably behind the
318 colonisation front in the North West part of the country) ; the high level of debt in the
319 sector; the environmental problems caused by deforestation, the massive use of
320 mineral fertilisers, soil erosion and greenhouse gas emissions (Sabourin, 2014).

321 Brazil's exports of animal products amount to €13.5 billion in 2018, or 19% of total agri-
322 food exports. They are dominated by poultry meat (41%), beef (40%) and, far behind,
323 pork (8%). Brazil has a small deficit in dairy products (-€450 million). It exports the
324 equivalent of 31% of its poultry meat production, 23% of its pigmeat production and
325 20% of its beef production. Brazil's main clients in animal products are China (31% of
326 the total in 2018), the EU (10%), Saudi Arabia (6%), Japan (4%), the United Arab
327 Emirates (4%) and Egypt (4%). The United States, although less distant
328 geographically, only account for 3% of Brazilian exports. Indeed, some sanitary (non-
329 tariffs) barriers for Brazilian exports to the US, notably for beef are still in place. After
330 having progressed from €2.4 billion in 2000 to €13.1 billion in 2012, Brazil's exports in
331 animal products have been more stable since then.

332 Despite a large population (207 million inhabitants) and an individual consumption of
333 meat that has increased over the last few decades, Brazil's imports of animal products
334 are still limited (€1.1 billion in 2018, 50% of which are dairy products). The main
335 suppliers are the neighbouring countries of Mercosur, including Argentina (31% of the
336 total), Uruguay (20%), Paraguay (18%) and the EU (16%).

337 The EU's trade balance with Brazil is clearly in deficit both in the agri-food sector (-€8.1
338 billion) and in animal products (-€1.2 billion in 2018). The deficit is substantial in poultry
339 meat (-€672 million) and beef (-€589 million), where the Brazilians are very
340 competitive.

341 In summer 2019 a trade agreement between the EU and Mercosur was signed after
342 20 years of negotiations. The agreement, which is now the subject of many disputes
343 within the EU, still needs to be ratified by each EU Member State and the European
344 Parliament before it can be implemented. Many consider that the impact of further

345 liberalisation with Brazil would be unfavourable to European livestock production and
346 damaging to the environment (Ambec et al., 2020).

347

348 ***Australia***

349 Scarcely populated (24 million inhabitants), but richly endowed with land (412 million
350 hectares, of which "only" 48 million are arable), Australia is a country with a large
351 surplus in animal products (€10.6 billion, mainly beef and sheep meat). As evidenced
352 by its positions in the World Trade Organization negotiations, Australia has long been
353 a proponent of trade liberalisation. According to the Organisation for Economic Co-
354 operation and Development (OECD) estimates, government support for Australian
355 farms is ten times lower than for European farms (OECD, 2020). Access to the
356 Australian market is not always straightforward due to geographic distance and the
357 existence of certain SPS non-tariff barriers.

358 Australia's exports in animal products amount to €12.6 billion in 2018 (fifth in the world),
359 or 45% of the country's agri-food exports. They doubled between 2000-09 and 2018
360 and mainly concern beef and veal (48%), sheep and goat meat (20%) and dairy
361 products (17%). They are mainly destined for China (21%), Japan (17%), the United
362 States (15%), South Korea (9%) and Indonesia (6%). Australia's imports in animal
363 products are very limited (€2 billion in 2018). They mainly concern dairy products (62%
364 of the total) and pig meat (23%). Three supplier countries provide the bulk of its
365 supplies: New Zealand (42%), the EU (33%) and the United States (16%).

366 Thus, Australia benefits from a positive trade balance in animal products (€10.6 billion
367 in 2018). It is positive with China (+€2.7 billion), Japan (+€2.1 billion), the United States
368 (+€1.5 billion) and South Korea (€1.1 billion), but negative with New Zealand (-€667
369 million) and the EU (-€342 million).

370 Australia's deficit with the EU is true for dairy products (-€346 million) and pigmeat
371 (-€245 million), but the situation is the opposite for beef (+€161 million) and sheepmeat
372 (+€102 million). Trade relations between these two areas could increase as a result of
373 the negotiations launched since June 2018 to reach a global trade agreement (Drake-
374 Brockman and Messerlin, 2018).

375

376 ***China***

377 China has become the country with the world's largest deficit in agri-food goods (-€54.9
378 billion in 2018), ahead of Japan (-€49.5 billion). In animal products, the balance has
379 sharply deteriorated from -€1.1 billion in 2000-09 to -€20.7 billion in 2018. This deficit
380 is mainly due to dairy products (-€9.4 billion) and pigmeat (-€3 billion). In addition to
381 this deficit in animal products, China is also the world's largest importer of vegetable
382 proteins, particularly soya, from the American continent, to feed domestic animals
383 (Gale et al., 2019). China's trade development in the agro-food sector must be seen in
384 the light of the country's low availability of agricultural land (9% of the world's arable
385 land for 20% of the population); the production difficulties (low water resources, limited
386 yields, rapid restructuring of small farms, etc.); the trade-off sometimes given to crop
387 production, including rice, over animal production in land use; the mistrust of many
388 Chinese consumers towards local products, mainly following the melamine milk crisis
389 in 2008; and, of course, the rapid growth in domestic needs linked to a gradual change
390 in diet, especially in the large cities. The consumption of meat by a Chinese has
391 quadrupled since the early 1980s and that of dairy products has increased all the more
392 rapidly as the level remains modest (40 kg per inhabitant per year compared with 280
393 kg for Europeans (Chaumet and Pouch, 2017).

394 Despite a high level of production (25% of world meat production, but only 5% of milk
395 production), China's exports of animal products have been low and relatively stable in
396 recent years. They reach €6 billion in 2018, i.e. about five times less than those of the
397 EU. Exports mainly concern poultry meat and are primarily destined for neighbouring
398 Asian countries (Japan, Vietnam).

399 China has become the world's largest importer of animal products (18% of the world
400 total). After representing an annual average of €3.6 billion over the period 2000-09,
401 Chinese imports have increased considerably to reach €26.8 billion in 2018. Imports
402 mainly concern dairy products (36%), beef (26%), pigmeat (15%) and poultry meat
403 (7%). Imports represent a third of domestic production in milk, 20% in beef and only
404 4% in pig meat.

405 The EU is China's leading supplier of animal products, accounting for 29% of its
406 imports in 2018. Mainly an exporter of dairy products and pigmeat, it is ahead of Brazil,
407 New Zealand and the United States. While the Chinese market represents an
408 opportunity for many companies seeking new outlets, it must also be considered that
409 this market does not offer all the guarantees of stability. Uncertainties about the level
410 of domestic supply, the signing of more or less advantageous bilateral agreements
411 with other competitor countries, changes in health regulations, exchange rate
412 variability, and political tensions between countries are all factors that can alter the
413 expected balances (Trégaro, 2016).

414

415 ***Japan***

416 With a small territory of 4.5 million hectares of agricultural land for 127 million people,
417 Japan is the world's fourth-largest importer of agri-food products. Despite strong
418 government support and the implementation of agricultural policy reforms (OECD,

419 2009), Japanese agriculture can only cover 40 per cent of the country's food needs
420 (Japan ministry of international affairs and communications, 2019).

421 In animal products, Japan's exports are marginal (€573 million in 2018); they mainly
422 concern dairy products and beef destined mainly for neighbouring Asian countries.
423 Imports, on the other hand, are very high (€14.8 billion), by far the highest in the world
424 in proportion to population. The imported volumes represent around 175% of domestic
425 production in beef, 115% in pork, 55% in poultry and 30% in milk and dairy products.
426 These imports come mainly from the United States (25%), the EU (15%), Australia
427 (14%) and Thailand (12%).

428 Japan's deficit in animal products reaches €13.5 billion in 2018, including €4.3 billion
429 of pigmeat, €3.5 billion of beef, €2.9 billion of poultry meat and €1.5 billion of milk and
430 dairy products. Japan's deficit in animal products has hardly increased over the recent
431 period. Not only is the Japanese population today decreasing, but the individual level
432 of consumption is now more stable.

433 European exports to the Japanese market mainly concern pigmeat (33% of the
434 country's imports) and dairy products (32%). The EU's trade relations with Japan are
435 set to strengthen following the entry into force of the Economic Partnership Agreement
436 (European Commission, 2018). The agreement removes the vast majority of duties
437 paid by EU companies exporting to Japan and a number of long-standing regulatory
438 barriers. For the dairy sector, the agreement envisages the removal of duties on many
439 cheeses such as Gouda and Cheddar (currently set at 29%). For pigmeat, trade will
440 be duty-free for processed meats, while fresh meat will be almost exempt. The
441 agreement also provides for the protection of more than 200 quality European
442 agricultural products (recognition of geographical indications) on the Japanese market.
443

444 **International trade in several animal sectors**

445 After an analysis focusing on the situation of the main countries involved in
446 international trade in animal products, this second part looks at the markets situation
447 of the following four productions: poultry meat; pork; beef and dairy products.

448

449 ***Poultry meat***

450 Poultry meat is today the first meat consumed and produced in the world. According
451 to OECD and Food and Agriculture Organization (FAO) statistics, global production of
452 poultry meat is on average 125 million tonnes annually over the three-year period
453 2017-19. The main producing countries are the USA (17.4% of world production in
454 2017-19), China (16.3%), Brazil (10.9%), the EU (12.0%) and Russia (3.9%).
455 According to the prospective work carried out by these same international
456 organisations, the world supply of poultry meat is expected to increase by 20.3 million
457 tonnes (+16%) between 2017-19 and 2029 (OECD-FAO, 2020).

458 Poultry is enjoying a much higher annual growth rate in consumption than other meats
459 for several reasons: i) the price paid by consumers is lower because of the zootechnical
460 performance obtained in this sector (a good consumption index); ii) the nutritional
461 quality of this (lean) meat is recognised; iii) this meat does not suffer from the religious
462 bans to which pigmeat (Islam and Judaism) or beef (India) are subject; iv) as
463 production is less directly linked to the land than other productions (cattle and sheep),
464 it is easier to develop it near urban areas with strong demographic growth; v) Moreover,
465 poultry is easier to develop vs other animal productions due to the "technological
466 packages" sold by some global companies to any local entrepreneur.

467 In 2018, international trade (excluding intra-EU) in poultry meat accounts for 11% of
468 world production. It has risen from €8.4 billion in 2000-09 to €19.1 billion in 2018

469 (including 50% of frozen chicken pieces, 24% of preparations and 12% of frozen whole
470 chickens). The share of whole chickens in chicken exports is steadily declining.

471 As the third largest producer, Brazil is the leading exporter, with 30% of international
472 flows expressed in value in 2018. Brazilian exports, which increased by €2.8 billion
473 between 2000-09 and 2018 (Figure 2), are destined for 17% to China (in 2018), 12%
474 to the EU, 12% to Saudi Arabia and 11% to Japan. This development of exports is
475 based on cost competitiveness and the adaptation of supply to the specific demands
476 of customers. With 18% of world exports by value, the United States rank second. US
477 products, which have a lower unit value than in Brazil, are marketed first in Mexico
478 (21% of exports in 2018, with low added value products), China (12%) and Canada
479 (10%). With 16% of world exports, including a large share of boneless cuts and cooked
480 meats, Thailand is ahead of China (10%) and the EU (9%).

481 The main importers of poultry meat are Japan (16% of world imports by value in 2018),
482 the EU (11%), China (10%), Saudi Arabia (5%), Mexico (5%) and the United Arab
483 Emirates (3%). Purchases are increasing in all the main purchasing countries. Thailand
484 is Japan's preferred supplier (51% of its supplies) ahead of China (26%) and Brazil
485 (20%). In China, imports come mainly from Brazil (50%) and the United States (21%).
486 With the end of export refunds in 2013, European exports to Middle Eastern countries
487 have become more difficult in the face of Brazilian competition. In volume terms, nearly
488 80% of poultry meat imports come from developing countries.

489

490 ***Pork meat***

491 World pigmeat production represents 116 million tonnes on average per year over the
492 three-year period 2017-19. The main producing countries are China (43.2%), far ahead
493 of the EU (20.5%), the USA (10.1%), Brazil (3.4%), Russia (3.2%), Vietnam (3.1%),

494 and Canada (1.8%). According to the prospective work of the OECD-FAO, world
495 supply should increase by 11.1 million tonnes (+9%) between 2017-19 and 2029.
496 International trade (excluding intra-EU) in pigmeat accounts for 7% of world production.
497 Exports of pigmeat (10.6 million tce in 2018) have increased throughout the studied
498 period, both in volume (+5.1 million tce between 2000-09 and 2018) and in value
499 (Figure 3). In 2018, the top three exporters of pigmeat are the EU (38% of the value),
500 the United States (29%) and Canada (13%). These three countries, which together
501 account for 80% of world exports, are followed far behind by Brazil (6%), China (4%)
502 and Mexico (3%). The competitive games between the three leading countries do not
503 depend solely on the differences in production costs at the breeding and processing
504 industry stage. They are also influenced by the internal health situation, bilateral
505 agreements between countries and the evolution of the parity between the euro and
506 the dollar. Moreover, their client countries are not always the same. Thus, for example,
507 the United States' leading customer for pork meat is Japan (25% of exports by value
508 in 2018), while China is in first place in the case of the EU (31% of exports by value in
509 2018) and the United States in the case of Canada (38%). Despite its status as the
510 world's largest pigmeat producer, China is also the second largest importer, with 20%
511 of world imports by value in 2018; this rate is expected to increase in 2019-2020 due
512 to the decline in livestock numbers induced by African swine fever (Mason-D'Croz,
513 2020). Suppliers to this strategic market are the EU (58% of the total in value), the USA
514 (14%), Brazil (13%) and Canada (9%). Between 2000-09 and 2018, Chinese imports
515 of pigmeat increased considerably (+€3.4 billion), including in relation to the leading
516 importing country, Japan (23% of world imports in 2018 and +€1.4 billion between the
517 two periods). South Korea, the United States and Mexico are also well placed in the
518 hierarchy of importing countries (between 6% and 8% of world imports for each

519 country); EU imports of pigmeat are less significant. The EU enforces strict sanitary
520 barriers for pig meat imports from third countries particularly in relation to Classical
521 Swine Fever status.

522

523 ***Beef and veal***

524 World beef production, which represents nearly 70 million tonnes in 2017-2019
525 (OECD-FAO, 2020), is expected to increase by 6.3 million tonnes by 2029. The main
526 producing countries are the United States (16.8%), ahead of Brazil (13.1%), the EU
527 (11.7%), China (9.3%), Argentina (4.1%), India (3.7%), Australia (3.7%) and Mexico
528 (2.8%).

529 International trade (excluding intra-EU) in beef accounts for about 13% of world
530 production (Institut de l'Elevage, 2020-a). Beef and veal is the leading meat traded in
531 value terms (€34.9 billion), but second in volume behind poultry meat and ahead of
532 pork. International trade in beef and veal, which grew strongly between 2000-09 and
533 2018 (+4.3 million tce), is influenced by a range of factors, including economic issues
534 (oil prices, growth rates in importing countries, currency devaluation, etc.) or health
535 issues (foot-and-mouth disease, bovine spongiform encephalopathy). The sudden
536 closure of the Japanese market to American exports in 2002-03 is an example often
537 cited to evoke this sensitivity (Chatellier, 2017).

538 The international trade in beef and veal is 73% (in value terms) frozen meat, 23% fresh
539 and chilled meat and 4% processed meat. It is dominated in exports by four countries
540 which together account for around two thirds of world exports (Figure 4). These are
541 Brazil (18% of volumes and 16% of value in 2018), India (14% and 9% respectively),
542 Australia (16% and 17%) and the United States (14% and 20%). The next countries
543 are New Zealand (6% of volumes), Argentina (6%), the EU (5%), Canada (5%),

544 Uruguay (5%), Paraguay (4%) and Mexico (3%). The production models adopted in
545 the four leading countries differ from one to another (in terms of breeds, rations, farm
546 structuring, etc.) and the types of products produced by the cattle industry are not
547 identical either, with varying selling prices. The development of Indian beef exports is
548 one of the most striking elements of recent years (Landes et al., 2016). In this country
549 where per capita consumption of beef is very low (less than 2 kg per year) and where
550 milk production is increasing rapidly, exports concern products sold at low prices and
551 mainly destined for Asian countries, including Vietnam and China. Note that India only
552 exports beef from male buffaloes. Strict religious edicts against slaughtering of *bos*
553 *taurus indicus* have become stricter since the Bharatiya Janata Party came to power,
554 with attacks reported against the people (mainly Muslims and lower casts) involved in
555 the beef industry. This is as much a constraint on the development of buffalo meat
556 export from India, as are sanitary status.

557 The main importers of beef and veal are China (21% of world imports by volume in
558 2018), the United States (12%), Vietnam (9%), Japan (8%), South Korea (6%) and
559 Russia (5%). Vietnam is a rather atypical importing country insofar as part of its imports
560 correspond to products that are then reshipped to the Chinese market. With 3% of
561 world imports, the EU imports less beef than South Korea or Egypt. In recent years, it
562 is mainly Asian countries, especially China (+1.6 million tce of imports between 2000-
563 09 and 2018) and Vietnam, which have contributed to the growth in international trade.

564

565 ***Milk and dairy products***

566 World milk production of all species has increased considerably over the decades, from
567 344 billion litres in 1961 to 839 billion litres in 2017-19 (Food and Agriculture
568 Organization, 2020). This increase is largely due to the increase in animal numbers,

569 progress in animal genetics and improved breeding techniques. The main producing
570 countries are India (21.9% of volumes in 2017-19), the EU (19.9%), the USA (11.7%),
571 Pakistan (5.4%) and China (4.1%). With 2.6% of world milk production, New Zealand's
572 contribution to international trade is very significant (26% by volume).

573 International trade (excluding intra-EU) in dairy products amounts to 72 million tonnes
574 in milk equivalent in 2018. This volume, which is equivalent to 8% of world milk
575 production, is growing at an average annual rate of around 2% (Institut de l'Elevage,
576 2020-b). Trade in dairy products increased throughout the period studied (+24.3 million
577 tonnes in milk equivalent between 2000-09 and 2018).

578 International trade in dairy products is divided into different categories of products,
579 including cheeses (20% of total trade in value in 2018), infant milk powder (16%), whole
580 milk powder (15%), flavoured milks (12%), skimmed milk powder (9%), butter (8%),
581 liquid milk (3%), whey (3%), concentrated milks (3%), casein (3%), yoghurt (3%) and
582 cream (2%). The structure of imports or exports according to these different product
583 categories differs greatly from one country to another. For example, the United States
584 are major importers of cheeses, while the Chinese are more likely to be purchasers of
585 whole milk powder and infant milk powder. Similarly, New Zealand's exports are more
586 oriented towards whole milk powder than towards cheeses, unlike the EU (Chatellier,
587 2016).

588 The world market for dairy products is dominated by a small number of countries for
589 export (Figure 5), mainly the EU (34% of world exports by value in 2018), New Zealand
590 (20%) and the United States (10%). Next come Australia (5%), Switzerland (4%), and
591 Belarus (3%). Between 2000-09 and 2018, the growth in exports was very significant
592 in New Zealand (+7.1 million tonnes in milk equivalent), this country being favoured by
593 one of the lowest milk production costs in the world, geographical proximity to the major

594 importing countries and an economic organisation dedicated to exports (5% of the milk
595 produced in this country is consumed locally). The United States, which historically
596 exported few dairy products, have developed its exports, primarily to neighbouring
597 countries, including Mexico. The EU has also improved its performance, especially in
598 recent years, as domestic milk supply has been boosted following the end of milk
599 quotas in 2015. The main dairy importing countries are, in value terms, China (€9.7
600 billion in 2018), the United States (€2.8 billion), Russia (€2 billion), Japan (€1.8 billion),
601 Saudi Arabia (€1.6 billion) and Mexico (€1.6 billion). Between 2000-09 and 2018, the
602 growth in China's dairy imports (+€8.8 billion) has no equivalent on a global scale; the
603 next following countries are the United Arab Emirates (+€964 million), the United
604 States (+€907 million), Russia (+€770 million) and Japan (+€747 million).

605

606 **Conclusion**

607 International trade in animal products, which amounts to €152 billion in 2018, is
608 dominated by exports from a few countries, including the EU, the USA, New Zealand,
609 Brazil and Australia. Exporters' strategies differ. Some countries, such as Brazil or New
610 Zealand, are particularly successful in terms of "price competitiveness", while others,
611 including EU Member States, seek to enhance "non-price competitiveness" (quality or
612 typicality of products, high degree of product processing, etc.). With a trade balance of
613 €23 billion in animal products in 2018, the EU contributes to the supply of Asian
614 countries, which are heavily in deficit (-€63 billion). This balance is mainly due to
615 surpluses in the dairy (€15.4 billion) and pig sectors (€7.2 billion). On the import side,
616 the role of China in recent developments is significant. The increase in the consumption
617 of animal proteins is, in fact, faster than the development of domestic supply, all the

618 more so as the pig sector is going through a major production crisis due to African
619 swine fever.

620 In many countries, however, trade in animal products represents a very limited share
621 of domestic production and consumption. This is particularly true in developing
622 countries, especially those in Africa, because animal products play a rather modest
623 role in the food supply and economic resources are often insufficient to import products
624 from industrialised countries.

625 The increase in world trade in the agro-food sector has been favoured by technical
626 progress in the broad sense (including logistics), by the adoption of recognised
627 standards (public and private) and by the increasing openness of economies. While
628 World Trade Organization negotiations have not changed much in recent years, many
629 economic areas, including the EU, are now signing bilateral agreements. Faced with
630 the growing importance of environmental and climate concerns, these trade
631 agreements are today the subject of many reservations (Balogh and Jám bor, 2020;
632 Kolcava et al., 2020); access to a good at a competitive price does not, in fact, justify,
633 at least in the eyes of many citizens/consumers, the fact that this has as its counterpart
634 a deterioration of the environment in the exporting country. Thus, the question of
635 sustainability is increasingly being placed at the heart of discussions of trade
636 agreements. The trade war between the United States and China is also likely to have
637 an influence on future trade trajectories (He et al., 2020). The same is true of recent
638 reflections within the EU on the so-called "farm to fork strategy" (European
639 Commission, 2020-b) or on the links between the Common Agricultural Policy and the
640 expectations of the Green Deal (European Commission, 2020c; Guyomard et al.,
641 2020).

642 The prospective analyses carried out by the OECD and the FAO up to 2029 highlight
643 several important developments for the global animal productions sector (OECD-FAO,
644 2020). In terms of global demand for animal products, the annual growth rate is
645 expected to decline over the next ten years compared to the last ten years. However,
646 three combined factors will continue to play a role in increasing (in absolute terms)
647 global demand: i) the annual growth of global population, which averages 1.1% (United
648 Nations, 2019), varies greatly between continents and countries, and are higher in
649 developing countries, particularly in Africa; ii) the evolution of per capita annual calorie
650 consumption ; iii) diet composition: animal proteins in diets is increasing rapidly in many
651 Asian countries (including China for meat and India for dairy products), especially
652 where household purchasing power is improving.

653 According to estimates, global meat production is expected to increase by about 12%
654 between 2017-19 and 2029 (+40 million tons, half of which from poultry meat), with
655 nearly 80% of this increase coming from developing countries. In dairy products, the
656 expected increase in global production is around 16% between these two dates; half
657 due to growth in livestock and the other half to improved animal performance (kg of
658 milk per animal per year). World meat trade is expected to increase by about 12% over
659 the same period, suggesting a lower annual growth rate than that observed over the
660 previous decade. In the dairy sector, trade growth should be higher, with a continuing
661 high contribution from the three main exporting zones (EU, New Zealand and the
662 United States).

663

664 **Ethics approval**

665 Not applicable.

666

667 **Data and model availability statement**

668 None of the data were deposited in an official repository.

669 BACI data are available on CEPII website: www.CEPII.fr.

670 BACI provides disaggregated data on bilateral trade flows for more than 5000 products
671 and 200 countries. The database is built from data directly reported by each country to
672 the United Nations Statistical Division (Comtrade). The CEPII developed a procedure
673 that reconciles the declarations of the exporter and the importer that may be different
674 in the original data.

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677

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679 Vincent Chatellier (alone): writing, reviewing and editing.

680

681 **Declaration of interest**

682 None.

683

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815

816 **Table 1.** International trade (exports, imports and trade balance) in animal products
 817 for different countries between 2000 and 2018 (current billion euros)

Countries	Exports			Imports			Trade balance		
	2000-09	2010-17	2018	2000-09	2010-17	2018	2000-09	2010-17	2018
European Union*	13.6	27.1	32.4	7.2	9.4	9.4	6.5	17.8	23.0
Other Europe	2.6	6.4	7.2	7.0	11.5	8.6	-4.4	-5.1	-1.4
Belarus	0.7	2.5	2.6	0.1	0.3	0.2	0.5	2.2	2.4
Ukraine	0.6	0.8	1.1	0.3	0.6	0.5	0.2	0.3	0.5
Russia	0.3	0.6	0.9	4.7	7.7	4.4	-4.4	-7.1	-3.5
North America	15.2	26.7	30.2	10.6	16.1	18.3	4.6	10.6	11.9
Canada	4.8	6.2	6.7	2.0	3.8	4.1	2.8	2.4	2.6
United States	10.5	20.5	23.5	8.6	12.2	14.1	1.9	8.3	9.4
Central America	1.4	3.4	4.3	4.9	8.4	9.5	-3.4	-4.9	-5.2
South America	10.0	20.7	22.1	2.3	5.6	4.8	7.7	15.1	17.3
Argentina	1.7	2.8	3.4	0.1	0.2	0.2	1.6	2.6	3.1
Brazil	6.2	13.5	13.5	0.4	1.0	1.1	5.8	12.4	12.4
Paraguay	0.2	0.9	1.1	0.0	0.1	0.1	0.2	0.9	1.0
Uruguay	0.9	2.1	2.6	0.0	0.1	0.2	0.8	2.0	2.4
Oceania	12.7	23.6	27.6	1.1	2.6	3.2	11.6	21.0	24.4
Australia	6.3	10.3	12.6	0.6	1.5	2.0	5.6	8.7	10.6
New Zealand	6.4	13.3	15.0	0.2	0.5	0.6	6.2	12.9	14.4
Asia	8.4	20.3	26.6	27.5	67.1	89.1	-19.1	-46.8	-62.5
India	0.8	2.6	3.9	0.1	0.2	0.2	0.7	2.3	3.6
Thailand	1.3	3.4	5.2	0.5	1.1	1.1	0.8	2.3	4.0
Japan	0.1	0.4	0.6	8.5	11.8	14.2	-8.3	-11.4	-13.5
South Korea	0.1	0.5	0.6	1.7	3.8	5.9	-1.6	-3.3	-5.3
China	2.4	4.5	6.0	3.5	17.0	26.8	-1.1	-12.4	-20.7
Vietnam	0.2	0.3	0.3	0.5	2.5	5.1	-0.3	-2.2	-4.8
Africa	1.0	2.2	1.8	4.5	10.2	9.8	-3.4	-7.9	-8.0
World	65.0	130.8	152.8	65.0	130.8	152.8	0.0	0.0	0.0

818 *Excluding intra-European Union trade

819 Source: INRAE, SMART-LERECO according to BACI

820

821 **Table 2.**

822 The trade balance in animal products in 2000-09 and 2018 (current billion euros)

Countries	Dairy products		Beef meat		Pig meat		Poultry meat	
	2000-09	2018	2000-09	2018	2000-09	2018	2000-09	2018
European Union*	6 125	15 440	-1 000	-807	2 716	7 251	-593	-497
Other Europe	-33	830	-1 091	-1 029	-1 376	-475	-1 101	62
Belarus	396	1 638	101	437	38	77	2	216
Ukraine	327	113	104	97	-83	-102	-81	336
Russia	-993	-1 690	-1 146	-1 205	-1 108	-58	-781	-129
Northern America	-652	1 121	305	2 864	2 620	5 613	2 032	2 929
Canada	-322	-791	639	952	1 296	1 573	-138	-57
United States	-321	1 927	-330	1 921	1 336	4 053	2 172	2 990
Central America	-1 373	-2 211	-743	232	-429	-1 421	-604	-1 663
South America	104	4	3 384	8 716	802	964	2 893	5 808
Argentina	465	711	879	1 913	-50	-60	79	218
Brazil	-71	-451	2 091	5 267	717	1 080	2 850	5 608
Paraguay	-15	-30	205	964	0	4	0	3
Uruguay	185	542	546	1 481	-12	-68	1	-8
Oceania	4 830	10 141	3 735	7 855	-129	-548	-28	-57
Australia	1 289	877	2 833	5 960	-55	-349	16	7
New Zealand	3 639	9 462	958	2 001	-46	-131	4	57
Asia	-6 816	-21 199	-4 094	-16 812	-4 048	-10 980	-2 134	-4 832
India	97	133	463	3 073	1	-2	3	8
Thailand	-154	883	-9	-116	26	83	955	3 089
Japan	-960	-1 511	-2 139	-3 491	-2 965	-4 341	-1 463	-3 062
South Korea	-205	-472	-731	-2 502	-390	-1 636	-97	-309
China	-826	-9 490	-201	-6 454	-226	-3 002	-43	-29
Vietnam	-168	-1 080	-88	-2 080	-3	-236	-57	-616
Africa	-2 184	-4 063	-497	-1 065	-157	-404	-464	-1 749
World	0	0	0	0	0	0	0	0

823 *Excluding intra-European Union trade

824 Source: INRAE, SMART-LERECO according to BACI

825

826 **Fig. 1.** International trade* in animal products between 2000 and 2018 (current billion
827 euros). *Excluding intra-European Union trade. Source: INRAE, SMART-LERECO
828 according to BACI

829

830 **Fig. 2.** Main poultry meat exporters between 2000 and 2018 (current billion euros).
831 *Excluding intra-European Union trade. Source: INRAE, SMART-LERECO according
832 to BACI

833

834 **Fig. 3.** Main pigmeat exporters between 2000 and 2018 (current billion euros).
835 *Excluding intra-European Union trade. Source: INRAE, SMART-LERECO according
836 to BACI

837

838 **Fig. 4.** Main beef meat exporters between 2000 and 2018 (current billion euros).
839 *Excluding intra-European Union trade. Source: INRAE, SMART-LERECO according
840 to BACI

841

842 **Fig. 5.** Main exporters of dairy products between 2000 and 2018 (current billion euros).
843 *Excluding intra-European Union trade. Source: INRAE, SMART-LERECO according to
844 BACI









