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Top 10 species groups in global aquaculture 2017

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Highlights (2017)

Freshwater fishes

- Carps, barbels and other cyprinids: #1 species group, accounting for a quarter of global aquaculture production quantity (112 million tonnes) and value (USD 250 billion) in 2017; including 38 ASFIS species items farmed in 92 countries (or territories); four carp species (grass carp, silver carp, common carp and bighead carp) are among the top 10 ASFIS species items by quantity and/or value.
- Tilapias and other cichlids: 5.25 percent (#4) of world aquaculture by quantity and 4.42 percent (#4) by value; the most popular species group farmed in 127 countries; Nile tilapia is the #9 ASFIS species item by quantity and #8 by value.
- *Catfishes*: 4.93 percent (#7) of world aquaculture by quantity and 4.24 percent (#5) by value; including 27 ASFIS species items farmed in 86 countries.
- Freshwater perch-like fishes: 2.85 percent (#9) of world aquaculture by value; a high-value group, including nine ASFIS species items farmed in 30 countries.
- Freshwater fishes nei: 2.19 percent (#10) of world aquaculture by quantity; including miscellaneous freshwater fishes farmed in 65 countries.

Diadromous fishes

Salmons, trouts, smelts: 3.11 percent (#9) of world aquaculture by quantity and 8.94 percent (#3) by value; a high-value group, including 20 ASFIS species items farmed in 83 countries; Atlantic salmon is the #2 ASFIS species item by value.

Crustaceans

- Marine shrimps and prawns: 4.92 percent (#8) of world aquaculture by quantity and 13.71 percent (#2) by value; a high-value group, including 14 ASFIS species items farmed in 60 countries; whiteleg shrimp is the #6 ASFIS species item by quantity and #1 by value.
- Crayfishes: 4.01 percent (#6) of world aquaculture by value; a high-value group, including seven ASFIS species items farmed in 15 countries; red swamp crawfish is the #5 ASFIS species item by value.
- *Freshwater crabs*: 3.82 percent (#8) by value; a high-value group, including one species farmed in three countries, the Chinese mitten crab, which is the #6 ASFIS species item by value.

Molluscs

- Oysters: 5.10 percent (#5) of world aquaculture by quantity and 2.72 percent (#10) by value, including 12 ASFIS species items farmed in 44 countries; cupped oysters nei is the #4 ASFIS species item by quantity.
- Clams, cockles, arkshells: 5.05 percent (#6) of world aquaculture by quantity and 3.92 percent (#7) by value; including 29 ASFIS species items farmed in 21 countries; Japanese carpet shell is the #7 ASFIS species item by quantity and #10 by value.

Aquatic plants

- Red seaweeds: 15.42 percent (#2) of world aquaculture by quantity; including eight ASFIS species items farmed in 32 countries; *Eucheuma* seaweeds nei and *Gracilaria* seaweeds are, respectively, the #2 and #7 ASFIS species item by quantity.
- Brown seaweeds: 12.30 percent (#3) of world aquaculture by quantity; including eight ASFIS species items farmed in 12 countries; Japanese kelp is the #1 ASFIS species item by quantity.

World aquaculture, excluding China

- *Milkfish*: 3.63 percent (#9) of world aquaculture, excluding China, by quantity and 2.41 percent (#10) by value; a diadromous fish group, including one species farmed in 18 countries.
- Marine perch-like fishes: 3.42 percent (#7) of world aquaculture, excluding China, by value; a high-value marine fish group, including 44 ASFIS species items farmed in 42 countries.
- Mussels: 2.6 percent (#10) of world aquaculture, excluding China, by quantity and 3.81 percent (#6) by value; a molluscs group, including 12 ASFIS species items farmed in 43 countries.

The latest FAO global aquaculture production statistics record 608 species items (under the ASFIS – Aquatic Sciences and Fisheries Information System – list of aquatic species) that have been farmed in global aquaculture during 1950–2017.^{1, 2} Among them, 424 species items were farmed in 2017, with concrete production statistics recorded in the FAO database (compared to 254 species items in 1990).³

This factsheet examines 2017 global aquaculture production of these 424 species items to identify the top 10 most farmed ASFIS species items (in terms of quantity or value); the top 10 most farmed species groups;⁴ and the top 10 species groups in world aquaculture, excluding China.⁵ More information about top 10 aquaculture species (groups) at the regional level and national level (for major aquaculture producers) can be found in the supplementary materials to this factsheet.

TOP 10 ASFIS SPECIES ITEMS BY PRODUCTION QUANTITY

By production quantity (live weight), the ten most produced ASFIS species items in world aquaculture 2017 (**Table 1**) are the following: three seaweeds (Japanese kelp #1, *Eucheuma* seaweeds nei⁶ #2 and *Gracilaria* seaweeds #7); four freshwater fishes (grass carp #3, silver carp #5, Nile tilapia #9 and common carp #10); two molluscs (cupped oysters nei #4 and Japanese carpet shell #8); and one crustacean (whiteleg shrimp #6). Among them, *Eucheuma* seaweeds nei, *Gracilaria* seaweeds and cupped oysters nei are species groups, whereas the other seven ASFIS species items are single species.

The share of these top 10 species items in 2017 world aquaculture production quantity varies from 9.98 percent (Japanese kelp) to 3.69 percent (common carp); and they altogether accounted for half of the world's aquaculture production tonnage (**Table 1**).

Among these top 10 species items, Nile tilapia and common carp are the two most popular species farmed in 78 countries (or territories)⁷ in 2017,⁸ followed by two carp species: grass carp (farmed in 38 countries) and silver carp (farmed in 37 countries). Whiteleg shrimp, a major international seafood commodity, is also farmed in a number of countries (36 in 2017), whereas the other top 10 ASFIS species items are farmed in a relatively fewer number of countries (**Table 1**).

| Top 10 ASFIS species items | | | World aquaculture (2017 quantity) | | | |
|------------------------------|--|---------------------|---|--|--|--|
| ASFIS species | Scientific name | ISSCAAP division | Number of countries farming the species item | World production quantity of the species item (live weight; tonnes) | Share of world production quantity of all species (%) | |
| 1. Japanese kelp | Laminaria japonica | Aquatic plants | 4 | 11 174 505 | 9.98 | |
| 2. Eucheuma seaweeds nei | Eucheuma spp. | Aquatic plants | 13 | 8 637 534 | 7.72 | |
| 3. Grass carp (= white Amur) | rp (= white Amur) Ctenopharyngodon idellus Freshwater fishes | | 38 | 5 519 487 | 4.93 | |
| 4. Cupped oysters nei | Crassostrea spp. | Molluscs | 9 | 4 905 215 | 4.38 | |
| 5. Silver carp | Hypophthalmichthys molitrix | Freshwater fishes | 37 | 4 704 673 | 4.20 | |
| 6. Whiteleg shrimp | Penaeus vannamei Crustaceans | | 36 | 4 456 603 | 3.98 | |
| 7. Gracilaria seaweeds | Gracilaria spp. | Aquatic plants | 7 | 4 311 040 | 3.85 | |
| 8. Japanese carpet shell | Ruditapes philippinarum | Molluscs | 7 | 4 228 206 | 3.78 | |
| 9. Nile tilapia | Oreochromis niloticus | Freshwater fishes | 78 | 4 130 281 | 3.69 | |
| 10. Common carp | Cyprinus carpio | Freshwater fishes | 78 | 4 129 100 | 3.69 | |
| Other species | | | n.a. | 55 749 978 | 49.80 | |
| All species | | | 196 | 111 946 623 | 100.00 | |

Table 1: Top 10 ASFIS species items by quantity in world aquaculture, 2017

Data source: FAO Global Fishery and Aquaculture Production Statistics 1950–2017 (v2019.1.0), published through FishStatJ (March 2019). Available at www.fao.org/fishery/statistics/software/fishstatj/en.

Notes: Constructed by the FAO WAPI Aquaculture Production Module (WAPI-AQPRN); see Table 1.2 in WAPI-AQPRN v.2018.1 for an example (www.fao.org/fishery/statistics/software/wapi/en). ISSCAAP = International Standard Statistical Classification of Aquatic Animals and Plants.

TOP 10 ASFIS SPECIES ITEMS BY PRODUCTION VALUE

Of the top 10 farmed species items by quantity in **Table 1**, only six items remain on the top 10 list in terms of (farmgate) production value (**Table 2**), whereas the three seaweeds (Japanese kelp, *Eucheuma* seaweeds nei and *Gracilaria* seaweeds) and cupped oysters nei drop down from the top 10 value list. This should not be surprising since a large part of the live weight tonnage of these species items reflects water contents (in the case of seaweeds) or shell weight (in the case of oysters). Two of these four "heavy" items still belong to the top 20 ASFIS species items in terms of value (cupped oysters nei #14

| Table 2: Top 10 |) ASFIS species items | by value in world | aquaculture, 2017 |
|-----------------|-----------------------|-------------------|-------------------|
|-----------------|-----------------------|-------------------|-------------------|

| To | World aquaculture (2017 value) | | | | |
|------------------------------|--------------------------------|-------------------|---|--|--|
| ASFIS species | Scientific name | ISSCAAP division | Number of countries farming the species item | World production value of the species item (farmgate; USD 1 000) | Share of world production value of all species (%) |
| 1. Whiteleg shrimp | Penaeus vannamei | Crustaceans | 36 | 26 743 265 | 10.72 |
| 2. Atlantic salmon | Salmo salar | Diadromous fishes | 14 | 16 697 788 | 6.69 |
| 3. Grass carp (= white Amur) | Ctenopharyngodon idellus | Freshwater fishes | 38 | 12 649 100 | 5.07 |
| 4. Silver carp | Hypophthalmichthys molitrix | Freshwater fishes | 37 | 10 268 207 | 4.11 |
| 5. Red swamp crawfish | Procambarus clarkii | Crustaceans | 3 | 10 003 537 | 4.01 |
| 6. Chinese mitten crab | Eriocheir sinensis | Crustaceans | 3 | 9 540 416 | 3.82 |
| 7. Common carp | Cyprinus carpio | Freshwater fishes | 78 | 8 635 866 | 3.46 |
| 8. Nile tilapia | Oreochromis niloticus | Freshwater fishes | 78 | 7 612 374 | 3.05 |
| 9. Bighead carp | Hypophthalmichthys nobilis | Freshwater fishes | 19 | 7 318 744 | 2.93 |
| 10. Japanese carpet shell | Ruditapes philippinarum | Molluscs | 7 | 6 957 089 | 2.79 |
| | n.a. | 133 152 775 | 53.35 | | |
| | All species | 196 | 249 579 163 | 100.00 | |

Data source: FAO Global Fishery and Aquaculture Production Statistics 1950–2017 (v2019.1.0), published through FishStatJ (March 2019). Available at www.fao.org/fishery/statistics/software/fishstatj/en.

Notes: Constructed by the FAO WAPI Aquaculture Production Module (WAPI-AQPRN); see Table 1.2 in WAPI-AQPRN v.2018.1 for an example (www.fao.org/fishery/statistics/software/wapi/en). ISSCAAP = International Standard Statistical Classification of Aquatic Animals and Plants.

and Japanese kelp #17), whereas the two red seaweed species items drop much lower (*Gracilaria* seaweeds #32 and *Eucheuma* seaweeds nei #54).

In 2017, whiteleg shrimp (ranked #1 by value and #6 by quantity) was the largest farmed ASFIS species item in terms of farmgate value, followed by Atlantic salmon (ranked #2 by value and #15 by quantity). These are two major international seafood commodities favoured by consumers worldwide.

In contrast, red swamp crawfish (ranked #5 by value and #24 by quantity) and Chinese mitten crab (ranked #6 by value and #34 by quantity) are niche species produced and consumed primarily by a single country – China. In 2017, China cultured over 1 million tonnes of red swamp crawfish (95 percent of the world total), valued at USD 9.8 billion (98 percent of the world total). Its three-quarter million tonnes of farmed Chinese mitten crab production, valued at USD 9.5 billion, accounted for virtually the entire world production.

Besides the three carp species on the top 10 quantity list (**Table 1**), the top 10 value list (**Table 2**) includes an additional carp species (i.e. bighead carp), which is ranked #9 by value and #11 by quantity.

TOP 10 SPECIES GROUPS IN WORLD AQUACULTURE

If not careful, one may form a misperception, based on **Table 1** and **Table 2**, that in 2017 seaweeds are the largest aquaculture item in terms of quantity, while shrimps are the largest in terms of value. Indeed, carps are the unchallenged number 1 aquaculture species group in terms of both quantity (**Table 3**) and value (**Table 4**).

Carps, barbels and other cyprinids

In 2017, the ISSCAAP group "Carps, barbels and other cyprinids" (or carps in short) were farmed in 92 countries with total production of 28 million tonnes (USD 61 billion), accounting for a quarter of world aquaculture in terms of both quantity (**Table 3**) and value (**Table 4**). China and India are the two major carp-farming countries, accounting for, respectively, 71 percent and 14 percent of world carp aquaculture production tonnage in 2017.

FAO statistics record 38 carp species items farmed worldwide in 2017;⁹ they are primarily staple fish for domestic consumption. In addition to the four carp species that appear in **Table 1** and **Table 2** (grass carp, common carp, silver carp and bighead carp), other carp species items that belong to the top 20 quantity list include *Carassius* spp. (e.g. crucian carp, *Carassius carassius*) #12; Catla (*Catla catla*) #13; and Roho labeo (*Labeo rohita*) #18.

Table 3: Top 10 species groups by quantity in world aquaculture, 2017

| Top 10 species gro | World aquaculture (2017 quantity) | | | | | |
|--|-----------------------------------|---|--|---|---|--|
| Species group | ISSCAAP division | Number of ASFIS species items in the group farmed in global aquaculture | Number of countries farming the species group | World aquaculture production quantity of the species group (live weight; tonnes) | Share of world aquaculture production quantity of all species (%) | |
| 1. Carps, barbels and other cyprinids ¹ | Freshwater fishes | 38 | 92 | 28 345 338 | 25.32 | |
| 2. Red seaweeds ¹ | Aquatic plants | 8 | 32 | 17 258 438 | 15.42 | |
| 3. Brown seaweeds ¹ | Aquatic plants | 8 | 12 | 13 772 325 | 12.30 | |
| 4. Tilapias and other cichlids ¹ | Freshwater fishes | 18 | 127 | 5 880 586 | 5.25 | |
| 5. Oysters ¹ | Molluscs | 12 | 44 | 5 710 522 | 5.10 | |
| 6. Clams, cockles, arkshells ¹ | Molluscs | 29 | 21 | 5 658 458 | 5.05 | |
| 7. Catfishes ² | Freshwater fishes | 27 | 86 | 5 518 878 | 4.93 | |
| 8. Marine shrimps and prawns ³ | Crustaceans | 14 | 60 | 5 511 914 | 4.92 | |
| 9. Salmons, trouts, smelts ¹ | Diadromous fishes | 20 | 83 | 3 476 845 | 3.11 | |
| 10. Freshwater fishes nei ⁴ | Freshwater fishes | 1 | 65 | 2 456 181 | 2.19 | |
| Other species | | n.a. | n.a. | 18 357 140 | 16.40 | |
| All species | 424 | 196 | 111 946 623 | 100.00 | | |

Data source: FAO Global Fishery and Aquaculture Production Statistics 1950–2017 (v2019.1.0), published through FishStatJ (March 2019). Available at www.fao.org/fishery/statistics/software/fishstatj/en.

Notes: Constructed by the FAO WAPI Aquaculture Production Module (WAPI-AQPRN); see Table 1.6 in WAPI-AQPRN v.2018.1 for an example (www.fao.org/fishery/statistics/software/wapi/en). ISSCAAP = International Standard Statistical Classification of Aquatic Animals and Plants. ¹ISSCAAP group. ²Subgroup of the ISSCAAP group "Miscellaneous freshwater fishes", including freshwater fishes of the order of Siluriformes. ³Same as the ISSCAAP group "Shrimps, prawns". ⁴ASFIS species item that represents a group of miscellaneous freshwater fishes.

Table 4: Top 10 species groups by value in world aquaculture, 2017

| Top 10 species gro | World aquaculture (2017 value) | | | | | |
|--|--------------------------------|---|-------------|---|---|--|
| Species group | ISSCAAP division | Number of ASFIS species items in the group farmed in global aquaculture | | World production value of the species group (farmgate; USD 1 000) | Share of world production value of all species (%) | |
| 1. Carps, barbels and other cyprinids ¹ | Freshwater fishes | 38 | 92 | 61 437 284 | 24.62 | |
| 2. Marine shrimps and prawns ² | Crustaceans | 14 | 60 | 34 220 879 | 13.71 | |
| 3. Salmons, trouts, smelts ¹ | Diadromous fishes | 20 | 83 | 22 310 102 | 8.94 | |
| 4. Tilapias and other cichlids ¹ | Freshwater fishes | 18 | 127 | 11 031 140 | 4.42 | |
| 5. Catfishes ³ | Freshwater fishes | 27 | 86 | 10 569 972 | 4.24 | |
| 6. Crayfishes⁴ | Crustaceans | 7 | 15 | 10 008 865 | 4.01 | |
| 7. Clams, cockles, arkshells ¹ | Molluscs | 29 | 21 | 9 779 660 | 3.92 | |
| 8. Freshwater crabs ⁵ | Crustaceans | 1 | 3 | 9 540 416 | 3.82 | |
| 9. Freshwater perch-like fishes6 | Freshwater fishes | 9 | 30 | 7 110 761 | 2.85 | |
| 10. Oysters ¹ Molluscs | | 12 | 44 | 6 788 868 | 2.72 | |
| Other species | | n.a. | n.a. | 66 781 214 | 26.76 | |
| All species | 424 | 196 | 249 579 163 | 100.00 | | |

Data source: FAO Global Fishery and Aquaculture Production Statistics 1950–2017 (v2019.1.0), published through FishStatJ (March 2019). Available at www.fao.org/fishery/statistics/software/fishstatj/en.

Notes: Constructed by the FAO WAPI Aquaculture Production Module (WAPI-AQPRN); see Table 1.6 in WAPI-AQPRN v.2018.1 for an example (www.fao.org/fishery/statistics/software/wapi/en). ISSCAAP = International Standard Statistical Classification of Aquatic Animals and Plants. ¹ISSCAAP group. ²Same as the ISSCAAP group "Shrimps, prawns". ³Subgroup of the ISSCAAP group "Miscellaneous freshwater fishes", including freshwater fishes of the order Siluriformes. ⁴Subgroup of the ISSCAAP group "Freshwater crusctaceans", including freshwater decapod crustaceans of the superfamilies Astacoidea and Parastacoidea. ⁵Subgroup of the ISSCAAP group "Freshwater crustaceans", including freshwater decapod crustaceans of infraorder Brachyura. ⁶Subgroup of the ISSCAAP group "Miscellaneous freshwater fishes", including freshwater fishes of the superfamilies Astacoidea. ⁶Subgroup of the ISSCAAP group "Miscellaneous freshwater fishes", including freshwater fishes of the superfamilies Astacoidea.

Tilapias versus catfishes

Tilapias and catfishes are another two freshwater staple fishes that appear in both the quantity and value top 10 lists (**Table 3** and **Table 4**, respectively). In 2017, the 5.9 million tonnes (or USD 11 billion) of world aquaculture production of the ISSCAAP group "Tilapias and other cichlids" (tilapias in short) account for 5.25 percent (#4) of the world aquaculture production tonnage (or 4.42 percent, #4, in terms of value), whereas the 5.5 million tonnes (USD 10.6 billion) of farmed catfishes (i.e. freshwater fishes of the order Siluriformes) production are 4.93 percent (#7) and 4.24 percent (#5) of the world aquaculture production quantity and value, respectively.

Notably, the value share of tilapias or catfishes in world aquaculture is lower than their respective quantity share, reflecting the fact that they are generally low-value fish. While produced primarily for local consumption in many countries, tilapias and catfishes are also major international seafood commodities increasingly accepted as substitutes for traditional whitefish products.

According to FAO statistics, tilapias are the most popular aquaculture species group farmed in 127 countries in 2017. Major tilapia farming countries include China (27 percent of world tilapia aquaculture tonnage in 2017), Indonesia (22 percent), Egypt (16 percent), Bangladesh (5.7 percent), Brazil (4.9 percent), the Philippines (4.6 percent) and Viet Nam (4.0 percent).

While FAO statistics record 18 tilapia species items farmed worldwide in 2017, Nile tilapia is the dominant species in the group. Indeed, the Nile tilapia production of 4.1 million tonnes reported in FAO statistics (**Table 1**) is underestimated because the 1.3 million tonnes production in 2017 accounted under "Tilapia nei" is mostly Nile tilapia.

FAO statistics record 27 catfish species items farmed in 86 countries in 2017, including primarily *Pangasius* catfishes (51 percent of world catfish aquaculture tonnage) and *Clarias* catfishes (24 percent). Major catfish farming countries include Viet Nam (24 percent of world tonnage), Indonesia (23 percent), China (20 percent), India (9.9 percent), Bangladesh (9.4 percent), Nigeria (3.5 percent) and the United States of America (2.7 percent).

Red seaweeds versus brown seaweeds

Red seaweeds and brown seaweeds (two ISSCAAP groups) are, respectively, the #2 and #3 aquaculture species group in terms of quantity (**Table 3**), yet they drop down from the top 10 value list (**Table 4**); in the value list, brown seaweeds fell to #11 whereas red seaweeds fell to #13.

FAO statistics record eight red seaweed species items farmed in 32 countries in 2017, with Indonesia and China being the largest producers, accounting for, respectively, 56 percent and 28 percent of the world production tonnage. In addition to *Eucheuma* seaweeds – including, primarily, *Kappaphycus alvarezii* and *Eucheuma denticulatum* – and *Gracilaria* seaweeds, which are mostly farmed for industrial use, Nori (*Porphyra*) are another major red seaweeds (2.6 million tonnes; 2.3 percent of world production of all species), which are primarily farmed for direct human consumption.

FAO statistics record eight brown seaweed species items farmed in 12 countries in 2017, with China being the main producer (accounting for 87 percent of the world production tonnage), followed by the Republic of Korea (8.9 percent) and the Democratic People's Republic of Korea (4.0 percent). In addition to kelps, which are for both human consumption and industry use, Wakame (*Undaria pinnatifida*) is another major brown seaweed primarily used for human consumption; its 2.3 million tonnes of production in 2017 (2.1 percent of world production of all species) is ranked #16 among all species.

Oysters versus clams

Oysters and another ISSCAAP group "Clams, cockles, arkshells" (or clams in short) are, respectively, the #5 and #6 species groups on the top 10 quantity list (**Table 3**), with nearly the same production (5.7 million tonnes; 5.1 percent of world production of all species). Yet, clams are ranked #7 in the value list (USD 9.8 billion; 3.92 percent of all species), whereas oysters ranked #10 (USD 6.8 billion; 2.72 percent) (**Table 4**).

FAO statistics record 12 oyster species items (mostly cupped oysters *Crassostrea*) farmed in 44 countries in 2017, with China accounting for 85 percent of the world production tonnage, followed by the Republic of Korea (5.5 percent), Japan (3.0 percent), United States of America (2.5 percent) and France (1.1 percent).

FAO statistics record 29 clam species items farmed in 21 countries in 2017, with China accounting for 95 percent of the world production tonnage. Japanese carpet shell (also known as Manila clam) accounts for 75 percent of the total world clam production in 2017, followed by constricted tagelus (*Sinonovacula constricta*; 15 percent) and blood cockle (*Anadara granosa*; 7.3 percent).

Marine shrimps and prawns

Marine shrimps and prawns, i.e. the ISSCAAP group "Shrimps, prawns", is ranked #8 by quantity (5.5 million tonnes; 4.92 percent of world tonnage of all species) and #2 in terms of value (USD 34 billion;

FAO statistics record 14 marine shrimps and prawns species items farmed in 60 countries in 2017, with major producers including China (35.1 percent of the 5.5 million tonnes of world production), Indonesia (13.3 percent), Viet Nam (12.9 percent), India (11.7 percent), Ecuador (7.9 percent) and Thailand (6.2 percent). Whiteleg shrimp and giant tiger prawn (*Penaeus monodon*) account for, respectively, 81 percent and 13 percent of the world marine shrimps and prawns production tonnage in 2017.

Salmons, trouts, smelts

The ISSCAAP group "Salmons, trouts, smelts" (i.e. Salmoniformes) is the only diadromous species group on the top 10 lists, ranked #9 by quantity (3.5 million tonnes; 3.11 percent of all species quantity) and #3 by value (USD 22 billion; 8.94 percent of all species value). Like marine shrimps and prawns, Salmoniformes are also a high-value species group and one of the major international seafood commodities.

FAO statistics record 20 Salmoniformes species items farmed in 83 countries, with major producers including Norway (37.5 percent of the 3.5 million tonnes world production), Chile (24.6 percent), United Kingdom of Great Britain and Northern Ireland (5.9 percent), Iran (Islamic Republic of) (4.8 percent), Canada (4.3 percent) and Turkey (3.2 percent). Major species items in this group include Atlantic salmon (68 percent of the 3.5 million tonnes world Salmoniformes production), rainbow trout (*Oncorhynchus mykiss*; 23 percent) and coho salmon (*O. kisutch*; 5.2 percent).

Crayfishes

Crayfishes, a subgroup of the ISSCAAP group "Freshwater crustaceans" that includes freshwater decapod crustaceans of the superfamilies Astacoidea and Parastacoidea, is ranked #15 by quantity and #6 by value (**Table 4**). While the FAO statistics report seven crayfish species items farmed in 2017, the world crayfish aquaculture production is virtually attributed entirely to red swamp crawfish (**Table 2**).

Freshwater crabs

Freshwater crabs, a subgroup of the ISSCAAP group "Freshwater crustaceans" that includes freshwater decapod crustaceans of infraorder Brachyura, is ranked #19 by quantity and #8 by value (**Table 4**). The FAO statistics record only one fresh crab species (i.e. Chinese mitten crab) farmed in 2017, which is nevertheless the #6 ASFIS species item on the top 10 value list (**Table 2**).

Freshwater perch-like fishes

Freshwater perch-like fishes, a subgroup of the ISSCAAP group "Miscellaneous freshwater fishes" that includes freshwater fishes of the superfamily Percoidea, is ranked #18 by quantity (0.8 million tonnes; 0.7 percent of the world production quantity of all species) and #9 by value (USD 7.1 billion; 2.85 percent of the world production value) (**Table 4**). The much higher value share indicates that this is a high-value species group.

FAO statistics report nine freshwater perch-like fishes farmed in 30 countries worldwide in 2017, with 0.8 million tonnes of total production. Largemouth black bass (*Micropterus salmoides*) is the number 1 species in this group, accounting for 56 percent of the total production. While FAO statistics record six countries farming the species in 2017, China accounted for 99.7 percent of the world production.

Mandarin fish (*Siniperca chuatsi*) accounted for 41 percent of the 2017 world aquaculture production of freshwater perch-like fishes, and according to FAO statistics, China was the only producer of the species in 2017.

Freshwater fishes nei

The #10 species group in **Table 3** (i.e. freshwater fishes nei; 2.5 million tonnes accounting for 2.19 percent of global production of all species) is an ASFIS species item that represents a group of miscellaneous freshwater fishes. If this miscellaneous group is removed, then the ISSCAAP group "Scallops, pectens" (2.2 million tonnes accounting for 2.0 percent of global production of all species) would take the #10 place.

TOP 10 SPECIES GROUPS IN WORLD AQUACULTURE, EXCLUDING CHINA

China is the largest aquaculture producer, accounting for 57 percent of world aquaculture production in 2017 by live weight quantity and 60 percent by farmgate value. China is one of the major producers of nearly all the top 10 species groups in **Table 3** and **Table 4** except for "Salmons, trouts, smelts". Thus, one may wonder what the top 10 species patterns look like in world aquaculture, excluding China, or in other words, in the rest of the world (ROW) as opposed to China.

In terms of quantity, the top 10 species group list for world aquaculture, excluding China (**Table 5**), looks similar to the one with China included (**Table 3**). Eight of the ten species groups in **Table 3** remain in **Table 5**; the two exceptions are oysters and clams, which are replaced by milkfish (*Chanos chanos*) and mussels.

Despite that China accounted for nearly 60 percent of world aquaculture production tonnage in 2017, the ROW accounted for over 60 percent of world production of the following six top 10 species groups in world aquaculture (**Table 3**): (i) red seaweeds (71.8 percent); (ii) catfishes (79.9 percent); (iii) tilapias (73.1 percent); (iv) marine shrimps and prawns (64.9 percent); (v) Salmoniformes (97.8 percent); and (vi) freshwater fishes nei (76.3 percent) (**Table 5**).

Among the top 10 species groups in world aquaculture, excluding China (**Table 5**), the ROW accounts for over half of the world production tonnage for eight species groups except for carps (29.33 percent) and brown seaweeds (13.47 percent).

The first five species groups on the top 10 value list for world aquaculture (**Table 4**) remain on the list for world aquaculture, excluding China (**Table 6**), with some changes in the exact ranking. Yet the last five species groups in **Table 4** (i.e. crayfishes; clams, cockles, arkshells; freshwater crabs; freshwater perch-like fishes; oysters) are replaced by mussels, marine perch-like fishes, freshwater fishes nei, red seaweeds and milkfish in **Table 6**.

Nine of the top 10 species groups in the quantity list for world aquacluture, excluding China (**Table 5**), remain on the top 10 value list (**Table 6**). Brown seaweeds is the only exception, which is replaced by marine perch-like fishes.

| Top 10 species groups | | World aquaculture, excluding China (2017 quantity) | | | | |
|--|-------------------|--|---|---|---|--|
| Species groups | ISSCAAP division | Number of ASFIS species items in the group farmed in the ROW | Number of countries in the ROW farming the species group | ROW's production quantity of the species group (live weight; tonnes) | Share of ROW's production quantity of all species (%) | ROW's share of world production of the same species group (%) |
| 1. Red seaweeds ¹ | Aquatic plants | 7 | 31 | 12 382 358 | 26.02 | 71.75 |
| 2. Carps, barbels and other cyprinids ¹ | Freshwater fishes | 37 | 91 | 8 314 012 | 17.47 | 29.33 |
| 3. Catfishes ² | Freshwater fishes | 25 | 85 | 4 407 755 | 9.26 | 79.87 |
| 4. Tilapias and other cichlids ¹ | Freshwater fishes | 18 | 126 | 4 295 906 | 9.03 | 73.05 |
| 5. Marine shrimps and prawns ³ | Crustaceans | 14 | 59 | 3 575 264 | 7.51 | 64.86 |
| 6. Salmons, trouts, smelts ¹ | Diadromous fishes | 18 | 82 | 3 399 530 | 7.14 | 97.78 |
| 7. Freshwater fishes nei4 | Freshwater fishes | 1 | 64 | 1 873 492 | 3.94 | 76.28 |
| 8. Brown seaweeds ¹ | Aquatic plants | 8 | 11 | 1 854 685 | 3.90 | 13.47 |
| 9. Milkfish ⁵ | Diadromous fishes | 1 | 18 | 1 728 561 | 3.63 | 100.00 |
| 10. Mussels ¹ | Molluscs | 12 | 43 | 1 236 175 | 2.60 | 57.13 |
| Other species | | n.a. | n.a | 4 520 405 | 9.50 | n.a. |
| All species | | 404 | 195 | 47 588 142 | 100.00 | 42.51 |

Table 5: Top 10 species groups by quantity in world aquaculture, excluding China, 2017

Data sources: FAO Global Fishery and Aquaculture Production Statistics 1950–2017 (v2019.1.0), published through FishStatJ (March 2019). Available at www.fao.org/fishery/statistics/software/fishstatj/en.

Notes: Constructed by the FAO WAPI Aquaculture Production Module (WAPI-AQPRN); see Table 1.6 in WAPI-AQPRN v.2018.1 for an example. (www.fao.org/fishery/statistics/software/wapi/en). ISSCAAP = International Standard Statistical Classification of Aquatic Animals and Plants. 'ISSCAAP group. ²Subgroup of the ISSCAAP group "Miscellaneous freshwater fishes", including freshwater fishes of the order Siluriformes. ³Same as the ISSCAAP group "Shrimps, prawns". ⁴ASFIS species item that represents a group of miscellaneous freshwater fishes. ⁵Subgroup of the ISSCAAP group "Miscellaneous diadromous fishes", including the only living species of the family Chanidae, i.e. milkfish (*Chanos chanos*).

| Top 10 species gro | World aquaculture, excluding China (2017 value) | | | | | |
|--|---|--|---|---|--|--|
| Species groups | ISSCAAP division | Number of ASFIS species items in the group farmed in the ROW | Number of countries in the ROW farming the species group | ROW's production value of the species group (farmgate; USD 1 000) | Share of ROW's production value of all species (%) | ROW's share of world production value of the same species group (%) |
| 1. Salmons, trouts, smelts ¹ | Diadromous fishes | 18 | 82 | 22 114 103 | 21.98 | 99.12 |
| 2. Marine shrimps and prawns ² | Crustaceans | 14 | 59 | 19 383 158 | 19.26 | 56.64 |
| 3. Carps, barbels and other cyprinids ¹ | Freshwater fishes | 37 | 91 | 14 869 677 | 14.78 | 24.20 |
| 4. Catfishes ³ | Freshwater fishes | 25 | 85 | 7 934 388 | 7.89 | 75.07 |
| 5. Tilapias and other cichlids ¹ | Freshwater fishes | 18 | 126 | 6 722 395 | 6.68 | 60.94 |
| 6. Mussels ¹ | Molluscs | 12 | 43 | 3 835 250 | 3.81 | 89.71 |
| 7. Marine perch-like fishes ⁴ | Marine fishes | 44 | 42 | 3 439 126 | 3.42 | 71.97 |
| 8. Freshwater fishes nei⁵ | Freshwater fishes | 1 | 64 | 2 743 034 | 2.73 | 67.90 |
| 9. Red seaweeds ¹ | Aquatic plants | 7 | 31 | 2 473 324 | 2.46 | 46.91 |
| 10. Milkfish ⁶ | Diadromous fishes | 1 | 18 | 2 428 587 | 2.41 | 100.00 |
| Other species | | n.a. | n.a | 14 673 002 | 14.58 | n.a. |
| All species | | 404 | 195 | 100 616 045 | 100.00 | 40.31 |

Table 6: Top 10 species groups by value in world aquaculture, excluding China, 2017

Data source: FAO Global Fishery and Aquaculture Production Statistics 1950–2017 (v2019.1.0), published through FishStatJ (March 2019). Available at www.fao.org/fishery/statistics/software/fishstatj/en.

Notes: Constructed by the FAO WAPI Aquaculture Production Module (WAPI-AQPRN); see Table 1.6 in WAPI-AQPRN v.2018.1 for an example (www.fao.org/fishery/statistics/software/wapi/en). ISSCAAP = International Standard Statistical Classification of Aquatic Animals and Plants. 'ISSCAAP group. 2Same as the ISSCAAP group "Shrimps, prawns". 3Subgroup of the ISSCAAP group "Miscellaneous freshwater fishes", including freshwater fishes of the order Siluriformes. 'Subgroup of the ISSCAAP group "Miscellaneous freshwater fishes of the superfamily Percoidea. ⁵ASFIS species item that represents a group of miscellaneous freshwater fishes.", including the ISSCAAP group "Miscellaneous fishes", including the only living species of the family Chanidae, i.e. milkfish (*Chanos chanos*).

Milkfish

Milkfish, the #13 species group by quantity in world aquaculture, is ranked #9 by quantity (**Table 5**) and #10 by value (**Table 6**) in world aquaculture, excluding China. It is a diadromous fish (the only living species in the family Chanidae) farmed and consumed primarily in South-eastern Asia, with two major producers being Indonesia (73 percent of the 1.7 million tonnes of world milkfish aquaculture production in 2017) and the Philippines (24 percent).

Mussels

Mussels, an ISSCAAP group of bivalve molluscs ranked #12 by quantity in world aquaculture, is ranked #10 by quantity (**Table 5**) and #6 by value (**Table 6**) in world aquaculture, excluding China. FAO statistics record 12 mussel species items farmed in 44 countries worldwide (including China and 43 countries in the ROW) in 2017, with 2.2 million tonnes of total production. China and the ROW account for, respectively, 42.9 percent and 57.1 percent of the total production tonnage. Major farmed mussel producers in the ROW include Chile (15.8 percent of the 2.2 million tonnes of total production), Spain (11.2 percent) and New Zealand (4.6 percent).

Marine perch-like fishes

Marine perch-like fishes, a subgroup of the ISSCAAP group "Miscellaneous coastal fishes" that includes marine fishes of the superfamily Percoidea, is ranked #14 by value in world aquaculture and #7 in world aquaculture, excluding China (**Table 6**). Similar to freshwater perch-like fishes, marine perch-like fishes are also a high-value species group with a higher value share (1.9 percent) than quantity share (1.1 percent) in world aquaculture.

The FAO statistics report 1.2 million tonnes (USD 4.8 billion) of world farmed marine perch-like fishes production in 2017, contributed by the farming of 45 species items, including primarily seabreams (Sparidae; 30 percent of the 1.2 million tonnes of world production of marine perch-like fishes), drums/ croakers/meagres (Sciaenidae; 23 percent), European seabass (*Dicentrarchus labrax*; 17 percent), groupers (Serranidae; 15 percent) and Japanese seabass (*Lateolabrax japonicus*; 13 percent).

The farming of five marine perch-like fish species items (large yellow croaker, *Larimichthys croceus*; Japanese seabass, *Lateolabrax japonicus*; groupers nei, *Epinephelus* spp.; porgies, seabreams nei,

Sparidae; and red drum, *Sciaenops ocellatus*) in China accounts for 49.3 percent of the 1.2 million tonnes (or 28.0 percent of the USD 4.8 billion) of world marine perch-like fishes aquaculture production in 2017; the other 50.7 percent of the tonnage (or 72.0 percent of the value) comes from the ROW's farming of 44 marine perch-like species items in 42 countries (e.g. Turkey, 13.0 percent of the world tonnage; Greece, 8.3 percent; Egypt, 7.3 percent; and Japan, 5.0 percent).

OUTLOOK

Seaweeds

Seaweeds account for 28.4 percent of global aquaculture tonnage and 4.8 percent of global aquaculture value in 2017; the contributions are more than tilapias (5.3 percent in tonnage and 4.4 percent in value) and catfishes (4.9 percent in tonnage and 4.2 percent in value). Red seaweeds and brown seaweeds are the #2 and #3 species groups by quantity in 2017 world aquaculture (**Table 3**); and red seaweeds is the #9 species group by value in world aquaculture, excluding China (**Table 6**).

However, seaweeds, farmed in 46 countries in 2017 (32 for red seaweeds, 12 for brown seaweeds, 6 for green seaweeds and 5 for seaweeds nei), are less widely farmed than many other top 10 species groups, such as tilapias (127 countries), carps (92 countries), catfishes (86 countries), Salmoniformes (83 countries), and marine shrimps and prawns (60 countries).

There has been increasing recognition of the nutritional value of seaweeds as food, their many industrial applications (cosmetics, biofuels, pharmaceuticals, nutraceuticals, feed ingredients, among others), and their ecosystem services (carbon sequestration, eutrophication mitigation, etc.). Therefore, the popularity of seaweeds as an aquaculture item would tend to increase in the future.

Marine fishes

None of the top 10 species groups in world aquaculture (**Table 3** and **Table 4**) comes from the ISSCAAP division "Marine fishes". This should not be surprising since marine fishes account for only 2.8 percent of the world aquaculture production tonnage (or 5.2 percent of production value) in 2017.

However, marine perch-like fishes is already on the top 10 value list for world aquaculture, excluding China (**Table 6**), and it is the #14 species group (by quantity and by value) in world aquaculture. Considering marine fishes as being the largest component in global seafood consumption (thanks to the supply from capture fisheries), it is likely that one or more marine fish groups could become a top 10 species group soon, a prediction that may soon be verified with time.

SUPPLEMENTARY MATERIALS

The factsheet presents information extracted from the latest FAO data and statistics on global aquaculture production with limited discussion. Readers may refer to the forthcoming FAO publication *The State of the World's Aquatic Genetic Resources for Food and Agriculture* for a global assessment on aquatic genetic resources for food and agriculture based on national reporting.

More information about the top 10 species (groups) in 2017 at the regional level or national level (for major fish farming countries) can be found in a more comprehensive factsheet available at www.fao.org/3/ca5187en/ca5187en.pdf. The comprehensive factsheet also explains the methodology of WAPI species grouping used in the ranking exercise.

Information on the top 10 species (groups) in global, regional and national aquaculture presented in this factsheet and the more comprehensive factsheet is generated by the WAPI Aquaculture Production Module (WAPI-AQPRN), a data analysis tool developed by FAO. While the factsheets present top 10 species patterns in 2017, the tool allows similar analyses in any year and for any country or area when data are available. A previous version of the module (i.e. WAPI-AQPRN v.2018.1) is available for test use – see more information on the WAPI webpage (www.fao.org/fishery/statistics/software/wapi/en).

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Notes

- 1. Information presented in the factsheet is based on FAO Global Fishery and Aquaculture Production Statistics 1950–2017 dataset (v2019.1.0), released through FishStatJ (March 2019). Available at www.fao.org/fishery/statistics/software/fishstatj/en.
- 2. ASFIS species items could refer to either individual species, hybrids or groups of related species, such as families (when identification to species is impossible). More information about the ASFIS list of aquatic species can be found at www.fao.org/fishery/collection/asfis/en.
- 3. The 424 species items do not include two farmed species items with global production in 2017 recorded as negligible (i.e. < 0.5 tonnes) in the FAO database.
- 4. The species grouping is based on the International Standard Statistical Classification of Aquatic Animals and Plants (ISSCAAP; www.fao.org/fishery/static/ASFIS/ISSCAAP.pdf). Most of the species groups used in the ranking follow the classification of ISSCAAP groups that have a clear taxonomic scope ("Carps, barbels and other cyprinids", "Tilapias and other cichlids", etc.), whereas some species groups used in the ranking are subgroups of a miscellaneous ISSCAAP group (e.g. "Catfishes" and "Freshwater perch-like fishes" being two subgroups of the ISSCAAP group "Miscellaneous freshwater fishes"). A species group used in the ranking could be an individual ASFIS species item when the item is essentially a species group (e.g. Treshwater fishes nei) or when there is a lack of other species items to join it into a suitable taxonomic group (e.g. Cobia, *Rachycentron canadum*). More details about the species grouping used for the ranking are provided in the supplementary materials to this factsheet; see the complete ranking of all the species groups on the back cover.
- 5. In this document, China refers to mainland China.
- 6. Nei = not elsewhere included.
- 7. Unless specified otherwise, in this document the term country includes non-sovereign territory.
- 8. The number of countries farming Nile tilapia in 2017 should be much more than 78 since most aquaculture production categorized under the ASFIS species item "Tilapia nei" tends to be Nile tilapia.
- 9. The actual number of carp species farmed in 2017 may be more than the FAO record because some niche carp species may not be reported separately. Other species groups are subject to a similar situation.

World aquaculture production quantity (2017): 111 946 623 tonnes



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