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Dynamics and patterns of the egg industry in APEC member countries

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Professor Windhorst has had a longstanding involvement with the IEC, and together with Peter van Horne is developing the Economic and Statistical service that the IEC provides to members.

Introduction

The Asia-Pacific Economic Cooperation (APEC) was established in November 1989 in Canberra, Australia. It is a forum of 21 Pacific Rim member countries, organised as a cooperative and financed by contributions from its members. It was founded as a reaction to regional trade organisations in other parts of the world, such as the EU and NAFTA, and for the fear that Japan and other G8 member countries might dominate the economic activities in the Pacific region. The main goal of the new economic cooperation was to create new markets for agricultural products and other raw materials (Wikipedia 2017). The APEC's administrative office is located in Singapore and organises annual meetings for the heads of the governments of the member countries; APEC does not include India because of its location outside the Pacific Rim.

Population and GNP

In 2016, the 21 APEC member countries shared 38.6% of the global population, China alone 19.1%. From the data in Table 1 one can easily see that the number of inhabitants differ considerably. While China was in a leading position with 1.44 billion inhabitants, Maldives and Brunei Darussalam had less than 500,000.

Because of the economic strength of the USA, China and Japan, the share of the APEC member countries in the global Gross National Product surpassed their share in the global population considerably. In 2016, they contributed 59.4% to the global GNP, with the USA and China alone having almost 40%. The wide gap between the single member countries with regards to the market value of all their products and services becomes obvious when comparing the value of 18,569 billion US-\$ with only 17 billion of Brunei Darussalam.

The ranking of countries regarding their purchasing power parity (PPP) differed considerably from their ranking in population and GNP. Singapore, Brunei Darussalam and Hong Kong were in the top three positions, followed by the USA and Taiwan. The lowest values were to be found in the Philippines, Vietnam and Papua New Guinea.

Table 1:

Population, GNP and PPP in the APEC member countries (2016)

(Source: FAO, World Bank and APEC)

Population			GNP			PPP		
Country	Population (mill.)	Share (%)	Country	GNP (billion US-\$)	Share (%)	Country	PPP (US-\$)	Index (World =100)
China	1,441	19.1	USA	18,569	24.6	Singapore	87,856	548
USA	324	4.3	China	11,199	14.8	Brunei Dar.	77,441	483
Indonesia	264	3.5	Japan	4,393	6.5	Hong Kong	58,553	365
Russia	144	1.9	Canada	1,530	2.0	USA	57,467	358
Mexico	129	1.7	Korea, Rep.	1,411	1.9	Taiwan	48,095	300
Japan	127	1.7	Russia	1,283	1.7	Australia	46,790	292
Philippines	105	1.4	Australia	1,205	1.6	Canada	44,025	275
Viet Nam	96	1.3	Mexico	1,064	1.4	Japan	41,470	259
Thailand	69	0.9	Indonesia	932	1.2	New Zealand	39,059	244
Korea, Rep.	51	0.7	Taiwan	528	0.7	Korea, Rep.	35,751	223
Canada	37	0.5	Thailand	409	0.5	Chile	23,960	149
Peru	32	0.4	Hong Kong	321	0.4	Russia	23,163	144
Australia	24	0.3	Philippines	305	0.4	Mexico	17,862	111
Taiwan	24	0.3	Singapore	207	0.4	Thailand	16,917	106
Chile	18	0.2	Chile	247	0.3	China	15,553	97
Papua New G.	8	0.1	Viet Nam	203	0.3	Peru	13,022	81
Hong Kong	7	0.1	Peru	192	0.3	Indonesia	11,612	72
Singapore	6	0.1	New Zealand	185	0.2	Philippines	7,806	49
New Zealand	5	0.1	Papua New G.	17	<0.1	Vietnam	5,428	40
Brunei Dar.	0.4	<0.1	Brunei Dar.	17	<0.1	Papua New G.	2,800	17
APEC	2,912	38.6	APEC	44,316	59.4	APEC	-	-
World	7,550	100.0	World	75,543	00.0	World	16,031	100

The dynamics of laying hen husbandry

Between 1996 and 2016, the global laying hen inventory increased by 2.18 billion birds or 56.2%. In the same time period, the inventories of the APEC member countries grew by 820 million birds or 36.6%. The APEC countries contributed 37.8% to the global growth of the laying hen population (Table 2). The regional concentration remained very stable over the whole period, differing only between 59.5% in 2016 and 56.4% in 2006.

A closer look at the dynamics at country level shows that the five leading countries contributed between 46.6% (1996) and 39.6% (2016) to the total laying hen inventory of the APEC countries. China was in a dominating position, sharing 44.4% of the laying hen population of APEC in 2016, followed by the USA with 11.9% and Indonesia with 8.2%.

Table 3 ranks the member countries according to the increase of their laying hen inventories between 1996 and 2016. The number of laying hens in China grew by 316 mill. birds, in second place was Indonesia with a growth of 94 mill. birds, followed by the USA with 66 mill. Birds. The only countries with a decreasing inventory were Japan (- 11 mill.) and Hong Kong (- 0.2 mill.). The highest relative growth rates were to be found in Peru (212.5%), Chile (137.5%) and Thailand (130.0%); in contrast, Japan's laying hen inventory decreased by 7.5%.

A comparison between the dynamics in the development of the laying hen inventories at country level and population figures (Table 1) reveals a close interdependence. The four countries with the highest number of inhabitants also showed the highest absolute growth of laying hen inventories in the analysed time period.

Table 2:

The development of the laying hen inventories in the APEC member countries between 1996 and 2016

(Source: FAO database; own additions)

1996			2006			2016		
Country	Laying hens (mill.)	Share (%)	Country	Laying hens (mill.)	Share (%)	Country	Laying hens (mill.)	Share (%)
China	1,042	27.1	China	1,280	26.3	China	1,358	22.4
USA	299	7.8	USA	346	7.1	USA	365	6.0
Indonesia	157	4.1	Indonesia	200	4.1	Indonesia	251	4.1
Russia	146	3.8	Mexico	182	3.7	Mexico	203	3.4
Japan	146	3.8	Russia	145	3.0	Russia	195	3.2
Mexico	123	3.2	Japan	137	2.8	Japan	135	2.2
Thailand	70	1.8	Thailand	74	1.5	Malaysia	105	1.7
Korea, Rep.	51	1.3	Philippines	66	1.4	Thailand	91	1.5
Malaysia	48	1.2	Malaysia	60	1.2	Philippines	90	1.5
Philippines	41	1.1	Korea, Rep.	57	1.2	Korea, Rep.	71	1.2
Viet Nam	32	0.8	Viet Nam	45	0.9	Viet Nam	63	1.0
Taiwan	29	0.8	Taiwan	37	0.8	Taiwan	36	0.6
Canada	22	0.6	Canada	26	0.5	Canada	27	0.4
Australia	13	0.3	Australia	16	0.3	Peru	25	0.4
Chile	8	0.2	Peru	16	0.3	Chile	19	0.3
Peru	8	0.2	Chile	9	0.2	Australia	16	0.3
New Zealand	2	<0.1	New Zealand	3	<0.1	New Zealand	4	<0.1
Singapore	2	<0.1	Singapore	2	<0.1	Singapore	3	<0.1
Papua New G.	1	<0.1	Papua New G.	2	<0.1	Brunei Dar.	2	<0.1
Brunei Dar.	1	<0.1	Brunei Dar.	2	<0.1	Papua New G.	2	<0.1
Hong Kong	<1	<0.1	Hong Kong	<1	<0.1	Hong Kong	< 1	<0.1
APEC	2,241	57.8	APEC	2,705	56.4	APEC	3,061	59.5
World	3,874	100.0	World	4,872	100.0	World	6,052	100.0

Table 3:

Ranking of the absolute and relative change of the laying hen inventories in the APEC member countries between 1996 and 2014

(Source: own calculations)

Absolute change		Relative change	
Country	Mill. hens	Country	%
China	316	Peru	175.2
Indonesia	94	Viet Nam	128.6
Mexico	80	Philippines	106.8
USA	66	Malaysia	85.4
Malaysia	57	China	79.1
Philippines	49	Indonesia	61.8
Russia	49	Brunei Darussalam	60.4
Viet Nam	31	Mexico	57.8
Thailand	21	Chile	41.1
Korea Rep.	20	New Zealand	40.9
Peru	17	Papua New Guinea	40.6
Chile	11	Korea, Rep.	32.4
Taiwan	7	Taiwan	31.9
Canada	5	Thailand	31.4
Australia	3	Canada	24.8
New Zealand	2	USA	23.8
Brunei Darussalam	1	Singapore	22.3
Papua New Guinea	1	Russia	21.0
Singapore	1	Australia	14.3
Hong Kong	- <1	Hong Kong	- 0.2
Japan	- 11	Japan	- 8.3
APEC	820	APEC	36.6
World	2,178	World	56.2

The dynamics of egg production

Global egg production increased by 28.9 mill. t or 64.1% between 1996 and 2016. To this absolute growth, APEC member countries contributed 19.4 mill. t or 67.1% (Table 4). A closer look at the ranking of these countries shows the absolute dominance of China with a contribution of 35.9% to the global production volume in 2016, followed by the USA with 8.2%, Mexico with 3.7% and Japan with 3.5%. Japan, which ranked in third position in 1996 and 2006, was surpassed by Mexico in 2016. The contribution of the APEC member countries to the global egg production volume increased from 64.7% in 1996 to 65.7% in 2016. This documents the stability of the egg industry in the APEC member countries, but also indicates that in other parts of the world production also grew considerably, with the regional concentration being remarkably high. The spatial pattern of egg production in the APEC member countries is documented in Table 4. The leading three countries contributed 50.4% to the global production volume in 1996, 50.0% in 2006 and 47.8% in 2016. The decrease in the regional concentration is mainly due to the stagnation of Japan's egg production in the analysed time period.

In Table 5, the countries are ranked according to the absolute and relative growth of their egg production between 1996 and 2016. China shared 37.6% in the global growth of egg production, followed by the USA with 5.3% and Mexico with 5.1%. The dominant role of China is also documented with a 61.1% contribution to the absolute growth of egg production in the APEC member countries. A comparison with the ranking of the countries according to their relative growth reveals some remarkable differences. Nine countries more than doubled their production volume between 1996 and 2016. Extraordinary high relative growth rates showed Peru with 208.5%, Vietnam with 203.2%, Papua New Guinea with 175.0% and Chile with 135.4%. A negative trend was to be found in Taiwan, Japan and Hong Kong.

Table 4:

The development of egg production in the APEC member countries and their share in global egg production between 1996 and 2016
(Source: FAO database)

1996			2006			2016		
Country	1,000 t	Share (%)	Country	1,000 t	Share (%)	Country	1,000 t	Share (%)
China	15,632	34.7	China	20,604	35.8	China	26,500	35.9
USA	4,513	10.0	USA	5,432	9.4	USA	6,038	8.2
Japan	2,564	5.7	Japan	2,488	4.8	Mexico	2,720	3.7
Russia	1,220	3.9	Mexico	2,290	4.0	Japan	2,562	3.5
Mexico	1,236	2.7	Russia	2,100	3.6	Russia	2,413	3.3
Indonesia	629	1.4	Indonesia	1,011	1.7	Indonesia	1,428	1.9
Thailand	525	1.2	Korea, Rep.	537	0.9	Malaysia	831	1.1
Korea, Rep.	470	1.0	Thailand	513	0.9	Korea, Rep.	713	1.0
Malaysia	360	0.8	Malaysia	453	0.8	Thailand	680	0.9
Canada	330	0.7	Canada	400	0.7	Viet Nam	476	0.6
Taiwan	397	0.7	Taiwan	330	0.6	Philippines	450	0.6
Philippines	206	0.5	Philippines	330	0.6	Canada	431	0.6
Viet Nam	157	0.3	Peru	245	0.4	Peru	401	0.5
Australia	136	0.3	Viet Nam	199	0.3	Taiwan	335	0.5
Peru	130	0.3	Australia	171	0.3	Australia	237	0.3
Chile	96	0.2	Chile	124	0.2	Chile	226	0.3
New Zealand	42	0.1	New Zealand	51	0.1	New Zealand	59	<0.1
Singapore	18	<0.1	Singapore	22	<0.1	Singapore	27	<0.1
Brunei Dar.	4	0.1	Brunei Dar.	7	<0.1	Papua New G.	11	<0.1
Papua New G.	4	<0.1	Papua New G.	5	<0.1	Brunei Dar.	8	<0.1
Hong Kong	1	<0.1	Hong Kong	<1	<0.1	Hong Kong	<1	<0.1
APEC	29,130	64.7	APEC	37,311	64.4	APEC	48,546	65.7
World	45,020	100.0	World	57,930	100.0	World	73,890	100.0

Table 5:

Ranking of the absolute and relative change of egg production in the APEC member countries between 1996 and 2014

(Source: own calculations)

Absolute change		Relative change	
Country	1,000 t	Country	%
China	10,868	Peru	208.5
USA	1,525	Viet Nam	203.2
Mexico	1,484	Papua New G.	175.0
Russia	1,193	Chile	135.4
Indonesia	799	Malaysia	130.8
Malaysia	471	Indonesia	127.0
Viet Nam	319	Mexico	120.1
Peru	271	Philippines	118.4
Philippines	244	Brunei Darussalam	100.0
Korea; Rep:	243	Russia	97.8
Thailand	207	Australia	74.3
Chile	130	China	69.5
Canada	101	Korea, Rep.	51.7
Australia	101	Singapore	50.0
New Zealand	17	New Zealand	40.5
Singapore	9	USA	33.8
Papua New G.	7	Canada	30.6
Brunei Dar.	4	Thailand	29.5
Hong Kong	+/- 0	Hong Kong	+/- 0
Japan	- 2	Japan	- 0.1
Taiwan	- 62	Taiwan	- 15.6
APEC	17,777	APEC	66.7
World	28,870	World	64.1

Patterns of egg trade

Actual data on the dynamics and patterns of egg trade are only available for a limited number of countries. The most recent complete data set, as published by FAO documents the situation of 2013. This data will not be used here.

Egg trade has been rather volatile over the past decade, with fluctuation in egg exports and imports for various reasons. A sharp increase in the per capita consumption can result in increasing imports if the domestic production cannot meet the demand. Outbreaks of Avian Influenza (AI) can result in a considerable decline in the export volume due to the loss of laying hens, but also because of import restrictions or bans by countries which no longer accept imports of poultry products from a country with an outbreak of the disease.

Table 6 shows the fluctuation of egg exports from Thailand and the USA. The outbreaks of AI in Thailand and the USA caused a considerable reduction of export volumes. The outbreaks in the USA in 2015 resulted in import bans by 30 countries, this considerably reduced exports. In 2016 there were still countries that had not lifted their import bans, resulting in the export volume declining further. On the other hand, Thailand was able to export shell eggs again in larger amounts once the AI outbreaks were under control. An interesting dynamic showed that Mexico as a result of AI outbreaks in Mexico in 2014, had to import higher volumes of shell eggs. However, when AI showed up in the USA in 2015, imports decreased the following year, imports recovered again as there were no new outbreaks in the USA (Table 7).

Table 6:

The development of egg exports by the USA and Thailand resp. egg imports by Mexico between 2014 and 2016; data in t

(Source: IEC Annual Review 2017)

Year	USA (exports)	Thailand (exports)	Mexico (imports)
2014	133,272	150	26,061
2015	99,792	305	16,988
2016	81,648	12,510	22,226

For eight of the APEC member countries, export and import data are available for 2016 (Table 8). The trade balance was negative for Russia, Canada and Mexico, the other five countries showed a positive balance.

Table 7:

Egg exports and egg imports by selected APEC member countries (2016); data in t

(Source: IEC Annual Review 2017)

Country	Exports	Imports	Balance
USA	81,648	14,753	+ 66,895
China	4,600	0	+ 4,600
New Zealand	1,521	40	+ 1,481
Japan	3,244	2,934	+ 310
Australia	170	0	+ 170
Mexico	0	22,226	- 22,226
Canada	4,036	36,698	- 32,632
Russia	13,244	54,000	- 40,756

Summary

The 21 member countries of APEC play an important role in global laying hen husbandry and egg production. With a share of 38.6% in the global population, they contributed 59.5% to the global laying hen inventory and 65.7% to egg production in 2016, China alone provided almost 35.9%. Egg trade is regionally concentrated between only a few partner countries. These are the three NAFTA member countries, China and Hong Kong as well as Malaysia and Singapore. It can be expected that the APEC countries will be able to fasten their position in the global egg industry in the years to come.

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