

TABLE S8-22

## USPTO patents and patent families granted in food chemistry, by region, country, or economy: 1998–2018

(Number)

Region, country, or economy	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018			
	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families				
World	952	3,489	1,247	4,148	1,238	3,911	1,184	3,644	1,066	3,320	961	5,014	945	5,133	707	6,116	831	5,991	859	6,244	767	6,683	895	8,971	1,153	8,379	1,231	10,194	1,597	13,610	1,857	15,100	1,767	12,925	1,755	14,687	1,795	8,818	1,722	9,310				
North America	608	2,184	814	2,606	828	2,586	787	2,488	662	2,372	600	3,355	603	3,351	482	2,281	594	2,265	488	2,259	579	2,245	703	2,269	873	1,338	1,271	1,338	1,271	1,338	1,271	1,338	1,271	1,338	1,271	1,338	1,271	1,338	1,271	1,338	1,271	1,338	1,271	1,338
Canada	21	19	27	17	25	18	31	13	24	19	34	18	22	14	23	15	22	7	26	9	29	17	34	16	55	16	63	17	60	24	98	29	91	25	94	45	63	29	76	35	96	40		
Mexico	1	1	3	2	1	0	4	2	3	1	1	1	1	1	3	2	1	1	1	1	2	0	1	1	3	2	2	1	4	3	5	0	1	8	1	6	15	9	10	5	14			
Puerto Rico	1	1	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
United States	627	486	784	588	801	567	752	473	634	352	565	316	580	336	455	264	571	257	612	249	548	228	667	252	752	237	809	301	1,097	392	1,234	420	1,176	364	1,113	425	1,126	314	1,133	367	1,092	418		
All others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Central and South America	6	3	5	1	9	8	3	5	5	6	4	5	4	5	6	5	4	5	10	6	8	5	7	6	16	10	7	4	5	6	13	12	31	24	10	16	12	17	13	22	6	24		
Argentina	3	1	1	1	3	3	0	0	2	1	1	1	1	1	1	1	2	1	3	5	3	6	2	1	1	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0		
Brazil	0	0	1	0	5	4	1	2	2	5	0	2	3	4	3	3	2	2	1	2	2	2	1	4	12	7	2	3	10	22	2	14	6	17	3	19	2	3	19	2	23			
All others	3	2	3	0	1	2	2	3	1	0	3	2	0	0	1	2	1	2	1	2	0	2	1	2	0	3	2	2	0	2	8	2	6	2	4	2	4	2	4	2	2			
Europe	181	1,361	270	1,539	233	1,400	241	1,420	236	1,304	212	2,154	192	2,038	141	2,306	117	2,094	123	2,294	103	3,015	104	5,373	191	4,373	200	4,432	256	3,199	314	3,719	357	5,342	358	2,784	348	5,236	352	1,744	318	1,374		
EU	158	586	233	556	200	538	206	429	204	448	185	492	169	527	126	530	102	424	112	394	96	385	96	434	168	409	186	431	232	472	285	458	318	443	316	411	308	419	310	514	280	459		
Austria	3	8	4	9	4	8	5	9	1	8	2	9	8	7	2	10	3	8	5	6	3	6	5	8	5	8	10	4	9	9	10	7	9	10	5	10	5	5	3	5	2	5		
Belgium	3	6	7	4	8	4	6	3	3	4	6	13	5	6	2	4	8	4	3	6	4	4	3	6	4	7	5	12	7	14	4	11	2	11	3	8	16	11	45					
Denmark	13	5	24	10	28	8	15	5	21	7	19	11	8	8	15	13	12	11	12	9	11	11	11	11	24	19	4	9	27	6	23	3	21	7	24	6	25	18	4					
Finland	6	8	9	9	8	12	7	8	8	8	6	11	8	5	15	6	4	1	6	1	6	1	2	6	5	11	2	11	6	13	8	6	11	6	4	3	9	4	8	9	6			
France	25	100	37	101	20	96	27	115	32	85	36	104	22	103	22	126	16	125	14	97	14	78	10	87	27	62	22	84	31	113	45	75	51	91	48	91	42	70	44	73	34	55		
Germany	34	75	46	62	35	49	49	52	43	70	29	69	45	55	28	42	16	73	22	59	17	50	25	22	60	25	30	60	41	35	48	36	50	43	52	43	44	42	44	42	49			
Hungary	1	13	0	16	0	19	2	21	1	30	0	37	0	12	0	7	0	16	0	19	0	18	1	5	0	5	1	6	0	4	2	5	4	2	4	2	4	5	1	2				
Ireland	1	27	0	12	0	3	2	0	1	1	3	3	1	1	2	0	6	1	7	1	3	1	1	0	4	1	1	2	0	5	2	1	6	0	1	2	0	2	1	2				
Italy	11	84	17	118	16	117	23	45	11	57	12	127	6	16	10	19	11	23	10	19	11	23	10	19	12	34	8	27	19	33	18	23	20	23	8	30	10	26	95	30	87			
Netherlands	24	46	37	30	34	30	25	41	31	42	22	41	22	35	17	45	14	26	17	34	11	27	16	25	31	31	58	50	44	34	74	41	88	30	89	33	85	34	91	40	83	22		
Spain	3	45	8	48	3	78	6	29	8	38	3	67	2	68	5	110	3	67	3	59	4	50	5	106	8	98	3	75	4	83	10	64	12	64	12	79	14	62	12	67				
Sweden	9	11	9	9	12	11	11	12	11	7	9	5	15	4	6	3	7	3	5	6	3	6	2	7	5	5	2	7	3	8	2	7	3	5	2	5	2	5	4	3				
United Kingdom	24	12	35	8	30	9	27	17	35	18	36	12	28	10	15	20	14	6	17	9	11	9	10	10	20	14	23	11	29	16	18	11	27	15	27	10	24	20	33	19	25	15		
All others	1	147	1	121	1	93	0	72	1	74	0	67	0	71	0	78	1	59	2	61	1	99	0	95	0	92	2	80	12	102	7	156	10	139	6	134	6	138	5	99				
Other Europe	23	775	37	983	33	862	35	991	32	856	27	1,661	23	1,511	15	1,776	16	1,670	12	1,900	7	2,631	7	4,939	23	3,964	15	4,001	24	2,727	39	4,899	42	2,372	41	4,817	42	1,230	39	915				
Former Soviet Union	0	29	0	26	0	40	1	76	0	73	0	157	0	484	0	121	0	65	0	94	0	101	0	90	0	77	0	91	0	68	0	95	0	130	0	142	0	100	0	98	0	100		
Norway	1	6	4	9	2	7	2	14	8	9	4	5	3	8	3	8	3	8	0	12	1	3	1	1	8	1	2	2	3	4	2	5	2	5	4	3	5	3	6	6				
Russia	0	719	1	930	0	793	0	875	3	748	0	1,477	2	995	2	1,627	1	1,583	0	1,775	1	2,513	1	4,829	3	3,875	2	3,895	4	2,638	1	3,147	3	4,755	2	2,217	1	4,704	2	1,112	2	795		
Switzerland	21	19	32	16	31	20	30	26	17	25	21	20	15	24	10	18	10	12	11	14	5	12	5	13	11	8	11	11	17	13	24	10	29	10	31	8	35	6	32	11	29	12		
All others	0	1	0	1	0	2	2	1	2	1	2	2	1	0	1	2	3	0	5	1	2	0	1	5	0	4	2	2	0	5	3	4	0	3	2	3	0	3	6	2	2			
Asia	100	1,591	139	1,956	139	1,868	124	1,693	136	1,577	122	2,468	128	2,688	68	3,469	91	3,575	75	3,633	74	3,367	61	3,296	109	3,717	125	5																

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	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families				
China	3	164	1	199	4	460	4	631	5	472	3	635	4	788	2	1,001	2	1,167	5	1,123	3	1,051	1	1,154	3	1,640	6	2,596	10	6,760	10	8,025	15	6,150	21	7,318	23	6,386	28	3,441	26	4,017		
India	1	1	2	1	2	1	5	2	9	6	11	9	10	7	9	9	7	8	13	10	7	6	2	3	2	9	3	5	2	4	2	8	2	5	1	9	7	1	7	2	2			
Japan	81	1,165	118	1,304	116	1,174	99	877	104	758	93	1,104	96	1,046	48	1,037	65	929	49	900	49	1,064	43	1,194	84	1,271	85	1,452	95	1,217	102	1,065	102	946	100	932	87	1,154	89	972	76	987		
Malaysia	1	1	1	0	0	0	1	2	0	0	0	1	1	0	0	1	2	1	4	0	0	1	9	3	4	1	16	4	13	8	3	2	1	11	3	11	3	10	1	9				
Singapore	3	1	2	2	1	1	1	1	2	0	1	1	1	1	1	1	1	1	0	1	2	0	0	0	1	0	3	0	1	0	5	0	1	0	1	0	2	1	1	0	2	1	0	
South Korea	7	250	11	442	6	213	10	163	11	328	11	697	11	822	8	1,392	9	1,432	4	1,555	7	1,206	9	910	15	772	18	1,281	20	1,910	24	2,149	25	2,134	19	1,270	29	1,420	29	2,119	37	2,329		
Taiwan	5	8	2	6	8	15	4	15	2	11	4	19	4	19	3	28	3	34	5	27	3	26	1	26	2	39	5	10	46	8	51	7	55	6	55	7	9	70	7	50				
All others	0	3	1	2	2	4	1	3	3	2	0	3	2	5	0	2	1	3	1	10	1	2	0	1	0	3	1	3	1	2	0	2	2	6	1	4	4	5	1	2	4	4		
Middle East	5	3	4	6	10	29	7	20	8	13	8	13	5	15	3	22	5	9	4	11	3	23	2	7	5	7	20	4	11	12	12	7	13	2	14	9	19	12	21	4	23	10		
Israel	5	2	4	2	10	3	6	1	8	3	8	0	5	4	3	1	5	3	4	1	1	4	2	1	7	5	2	4	4	1	11	3	11	4	13	3	16	15	3	17	3	3		
All others	0	1	1	4	0	25	1	18	0	10	0	12	0	12	0	22	0	5	0	9	0	22	0	1	0	4	2	18	1	10	3	9	3	0	2	8	3	9	6	3	6	7		
Africa	0	12	3	22	5	9	3	8	3	27	3	23	3	18	0	16	1	20	1	10	1	11	3	2	5	2	11	3	7	2	8	1	11	1	4	3	2	3	3	3	3			
South Africa	0	7	3	11	4	0	2	5	3	7	2	7	3	9	0	11	1	6	7	1	7	1	4	1	2	0	3	0	1	3	0	1	1	1	3	0	2	0	2	0	2	1		
All others	0	5	0	11	1	8	1	3	0	20	1	16	0	9	0	5	0	14	0	3	0	3	0	5	0	2	1	11	0	7	0	8	0	10	0	3	0	1	0	3	1	2		
Australia and Oceania	10	7	12	9	14	11	19	9	16	13	13	11	9	17	7	16	19	20	8	31	2	14	17	16	19	13	17	31	13	31	11	32	16	38	15	46	17	33	22	18	19	30		
Australia	8	6	11	8	8	10	14	8	11	13	7	10	7	17	4	16	14	20	5	30	1	14	10	16	14	14	30	8	32	14	37	8	32	14	37	13	46	11	33	18	17	16	30	
New Zealand	2	1	1	1	6	0	5	1	5	0	5	1	2	0	2	0	4	0	2	1	1	0	7	0	3	1	3	3	0	2	3	0	2	1	2	1	6	0	4	1	3	0		
All others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Unclassified	0	5	1	9	0	1	0	1	0	8	0	7	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

EU = European Union; USPTO = U.S. Patent and Trademark Office.

## Note(s)

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

## Source(s)

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.