Technology Insight Report

PROBIOTICS

Patent iNSIGHT Pro
Transform Patents to Intelligence

Probiotics are live microorganisms thought to be beneficial to the host organism. According to the currently adopted definition by FAO/WHO, probiotics are: "Live microorganisms which when administered in adequate amounts confer a health benefit on the host". Lactic acid bacteria (LAB) and Bifidobacterium are the most common types of microbes used as probiotics; but certain yeasts and bacilli may also be helpful. Probiotics are commonly consumed as part of fermented foods with specially added active live cultures; such as in yogurt, soy yogurt,or as dietary supplements.

This report takes a look into the patenting activity around probiotics uncovering the inventors, patents, the companies and the intellectual property history behind these microbes.

Introduction to Probiotics

Probiotics are being used and consumed for decades in various forms of fermented and cultured foods and drinks - such as yogurt, kefir, cheese, sauerkraut and pickles. Elie Metchnikoff, the Russian physiologist is credited for discovering the benefits of probiotics. However, today, with the over-processing of modern day foods and beverages, fragile probiotics organisms are not as abundant in today's diet as they once were. This, combined with the increasing amount of stress, including dieting, traveling, and overuse of antibiotics and other pharmaceutical drugs, has created a deficiency of these beneficial bacteria in a majority of the population.

In order to protect itself from undesirable organisms, the human body has to maintain a proper balance of microflora throughout the bacterial ecosystem of the intestinal tract. Daily consumption of probiotic foods ensures that proper amounts of "friendly" bacteria are ingested by the human body.

Overview

With the help of Patent iNSIGHT Pro, we will analyze the patent data around Probiotics to find answers to the following:

- What does the IP publication trend for Probiotics look like and how have the filings evolved?
- Who are the top assignees or key players in Probiotics and what are their technology wise trends?
- Which microbes are used across various application areas across Probiotics?
- Which assignees hold the maximum inventions across different formulations?

To get deeper insights the patent set has been classified as follows:

By Processing Technologies

- Centrifugation
- Fermentation
- Homogenization
- Lyophilization
- Pascalization
- Pasteurization
- Pulse Electric Field
- Ultrafiltration
- Sterilization

By Applications

- Aqua Culture
- Bacteriocins
- Medical Applications
  a) Allergic Conditions
  b) Blood Pressure
  c) Cancer
  d) Cholesterol
  e) Diabetes Mellitus

f) Diarrhea
g) Gastrointestinal Tract
h) Helicobacter Pylori
i) Immune Functions and Infections
j) Immunomodulation Therapy
k) Inflammation
l) Lactose Intolerance
m) Oral Cavity
n) Skin Improvement

By Formulations

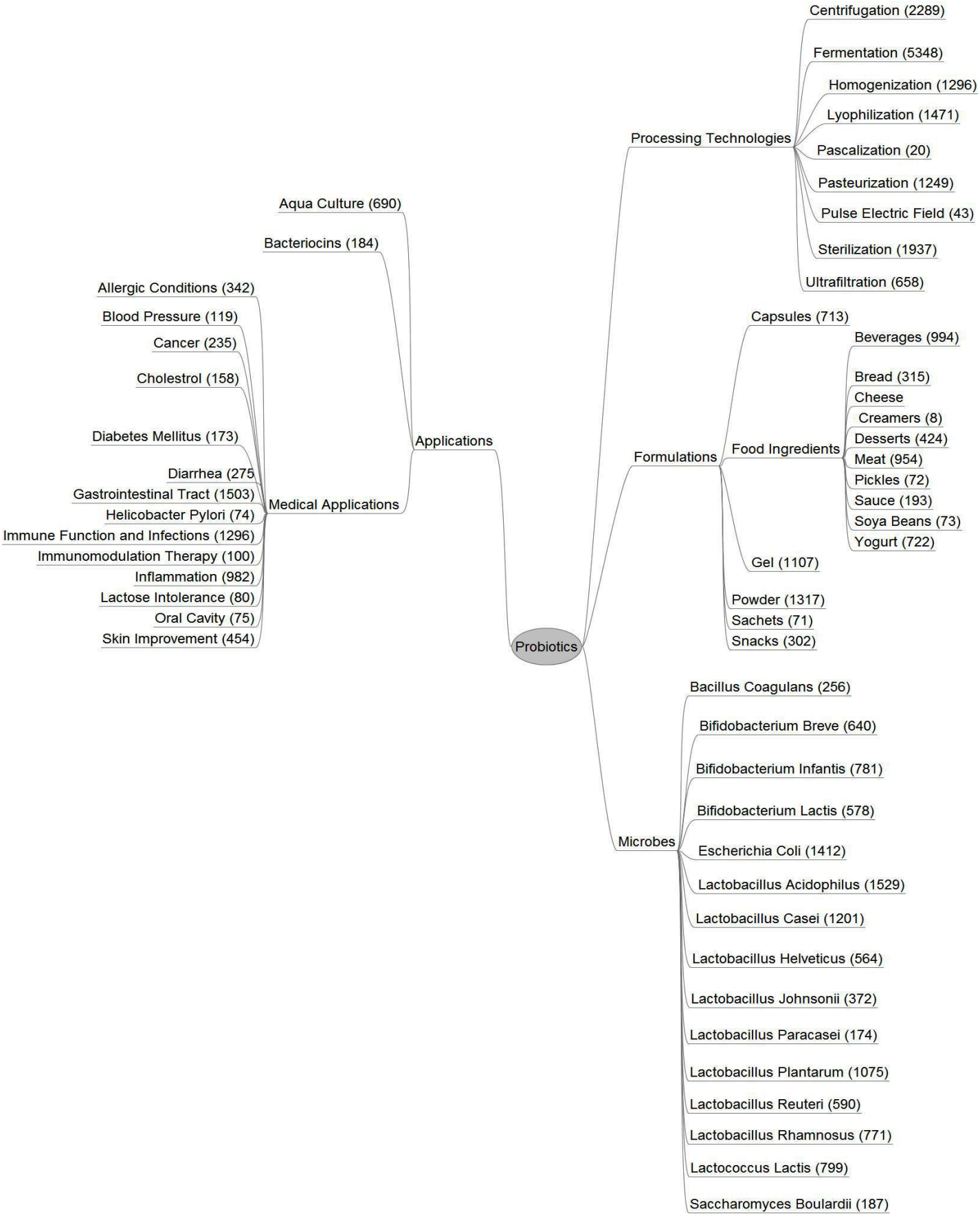
- Capsules
- Food Ingredients
  a) Beverages
  b) Bread
  c) Cheese
  d) Creamers
  e) Desserts
  f) Meat
  g) Pickles
  h) Sauce
  i) Soya Beans
- Yogurt
- Sachets
- Snacks

By Microbes

- Bacillus Coagulans
- Bifidobacterium Breve
- Bifidobacterium Infantis
- Bifidobacterium Lactis
- Escherichia Coli
- Lactobacillus Acidophilus
- Lactobacillus Casei
- Lactobacillus Helveticus
- Lactobacillus Johnsonii
- Lactobacillus Paracasei
- Lactobacillus Plantarum
- Lactobacillus Reuteri
- Lactobacillus Rhamnosus
- Lactococcus Lactis
- Saccharomyces Boulardii
- Solco Lactobacteria

The illustration below shows the different categories prepared and the number of records in each. The categorization involved defining a search strategy for each topic and then conducting the search using the Advanced Searching capability in Patent iNSIGHT Pro. Details of search strings used for each category are given in Appendix B.

PROBIOTICS CATEGORIZATION TREE



The Search Strategy

Using the commercial patent database PatBase as our data source we used the following search queries to create our patent set.

FT- Full Text
TAC – Title Abstract Claims
CL – Claims
IC – International Class

Search Query 1: (TAC= (probioti* or flora))

Search Query 2: ((CL=Bifidobacteri* or "Lactobacillus bifidus" or (lactic w/2 bacteri*) or LAB or Lactobacill* or Leuconostoc or Pediococc* or Lactococc* or Streptococc* or Carnobacteri* or Sporolactobacill* or Tetragenococc* or Lactobacillales or L. acidophilus or L. delbrueckii or L. salivarius or L. casei or L. plantarum or L. rhamnosus or L. reuteri or L. brevis or L. buchneri or L. fermentum or B. adolescentis or B. angulatum or B. bifidum or B. breve or B. catenulatum or B. infantis or B. lactis or B. longum or B. pseudocatenulatum or S. thermophilus or S. boulardii or yeast or bacillus or bacilli or Leuconostocaceae or Oenococc* or Weissella or "Lactobacillus acidophilus" or "Bifidobacterium adolescentis" or "Bifidobacterium angulatum" or "Bifidobacterium bifidum" or "Bifidobacterium breve" or "Bifidobacterium catenulatum" or "Bifidobacterium infantis" or "Bifidobacterium lactis" or "Bifidobacterium longum" or "Bifidobacterium pseudocatenulatum" or "Streptococcus salivarius" or "Streptococcus thermophilus" or "Saccharomyces boulardii" or S. boulardii or "Lactobacillus casei" or "Lactobacillus plantarum" or "lactobacillus rhamnosus" or "lactobacillus reuteri" or "lactobacillus brevis" or "lactobacillus buchneri" or "lactobacillus fermentum" or L. bulgaricus or "lactobacillus bulgaricus" or "lactobacillus caucasicus" or L. caucasicus or L. helveticus or "lactobacillus helveticus" or L.lactis or "Lactococcus lactis") and ((FT=(probioti* w/3 (diet* or supplement* or nutrient*)) or ((ferment* or culture* or curdl* or churn*) w/3 food* or product*)) or (TAC=(probioti* w/3 (food* or dairy* or milk* or cheese* or butter* or curd* or yoghurt* or yogurt* or yogourt* or cream or oleo or oleomargarine or margarine or cocoa or chocolate* or powder* or drink* or juice* or beverage* or pickle*)))) and IC=A23)

Class Description:

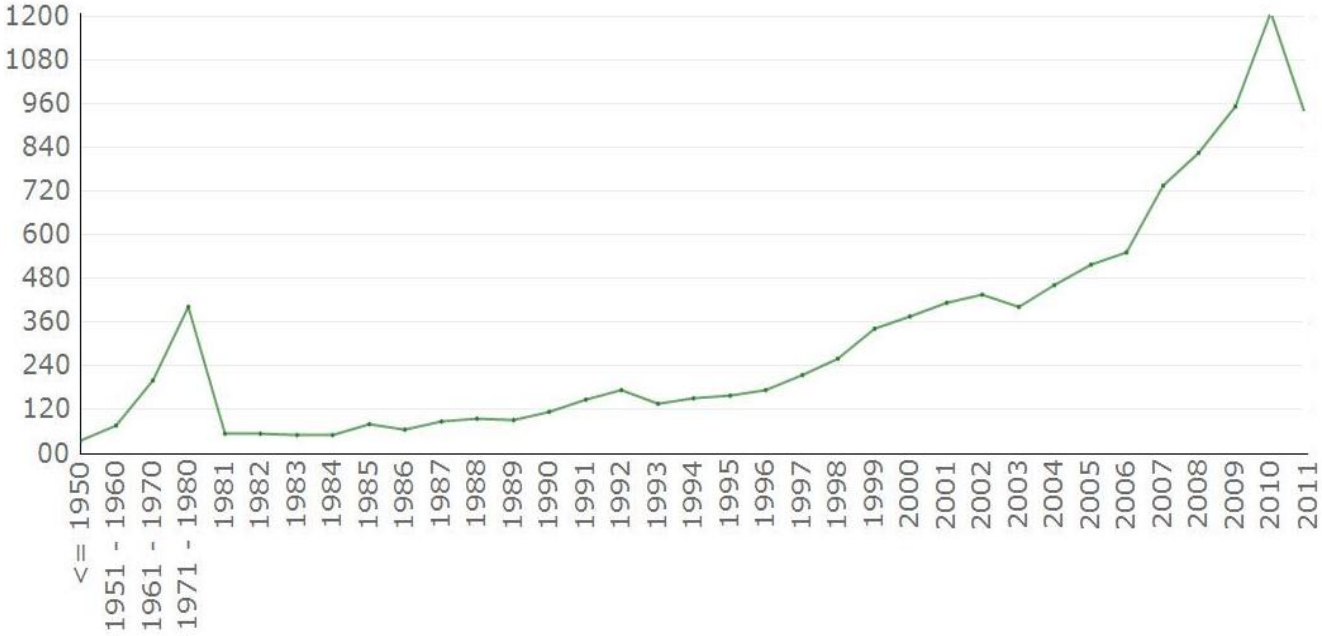
A23 - FOODS OR FOODSTUFFS; THEIR TREATMENT, NOT COVERED BY OTHER CLASSES

The queries were combined using the 'OR' operator and a patent set of 10958 records (with one publication per family) was generated.

The publications included in the report are updated as of **29th September, 2011.**

Publication Trend

What has been the IP publication trend for Probiotics?



Patents related to probiotics can be traced back to 1950 with around 400 patent records in 1970's, although the number of filings remained relatively low all the way up till the year 2000 with 370 records.

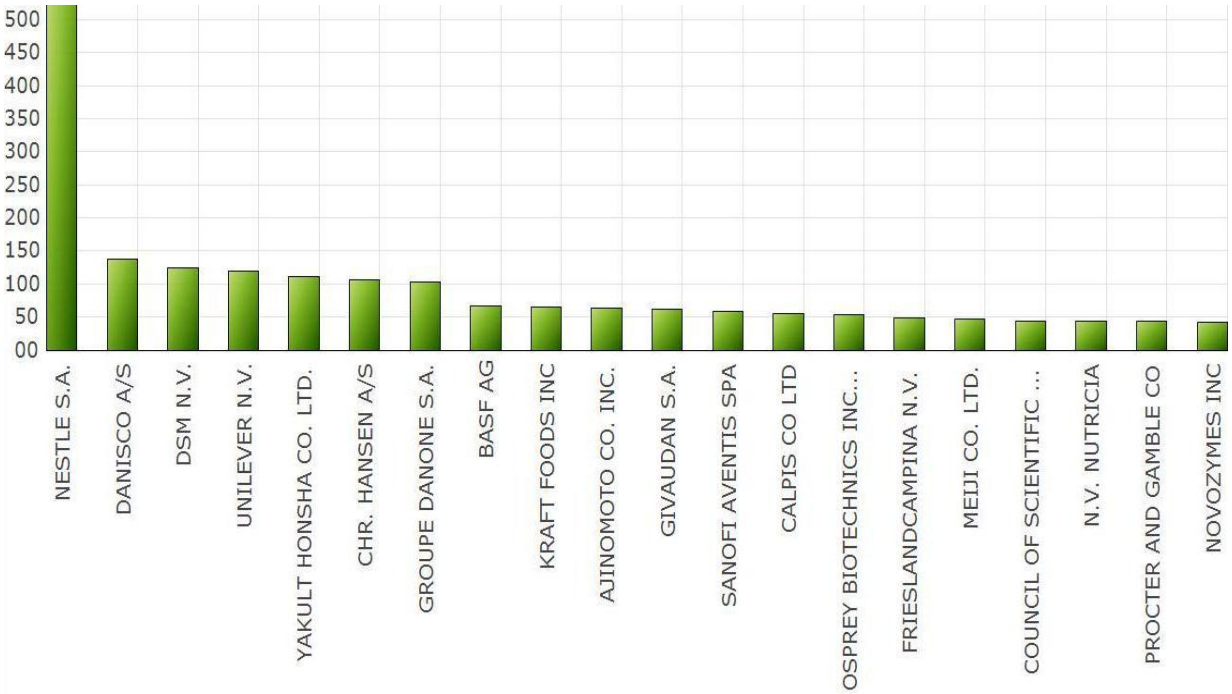
From the publication trend it appears the late 80's and early 90's had some activity in this field but real pursuit for building IP around probiotics happened only more recently in the last decade and has been quite consistent since. Noticeably there was considerable increase in publications for 2010 which saw around 1200 patents published during the year.

How we did it?

Once the patents were populated in Patent iNSIGHT Pro, the publication trend chart was generated on a single click using the dashboard tool.

Top Assignees

Who have been the top assignees or the key players within this industry?



The top assignees are:

1. NESTLE S.A.
2. DANSICO A/S
3. D.S.M N.V.
4. UNILEVER N.V.
4. YAKULT HONSHA CO. LTD.
5. CHR. HANSEN A/S
6. GROUPE DANONE S.A.
7. BASF AG
9. KRAFT FOODS INC.
10. AJINOMOTO CO. INC.
11. GIVAUDAN S.A.
12. SANOFI AVENTIS SPA
12. CALPIS CO LTD
14. OSPREY BIOTECHNICS INC.
15. FRIESLANDCAMPINA N.V.
16. MEIJI CO. LTD.
17. COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH
18. N.V. NUTRICIA
19. PROCTER AND GAMBLE CO
20. NOVOZYMES INC

How we did it?

Once the patents were populated in Patent iNSIGHT Pro, the assignee clean- up tools were used to normalize the names. Different cleanup tools were leveraged:

- To locate assignees for unassigned records
- To clean up records having multiple assignees
- To locate the correct assignee names for US records using the US assignments database
- To merge assignees that resulted from a merger or acquisition or name change.

Please refer Appendix A for more details on Assignee merging.

Once the Assignee names were cleaned up, the dashboard tool within Patent iNSIGHT Pro was used to find the top 20 assignees within the given patent set. A visual graph was created based on the results of the top assignees with the number of patents alongside each one.

The complete Assignee table in available in the following Excel file:
http://www.patentinsightpro.com/techreports/1011/List%20of%20Assignees.xls

Top Countries

How is research in Probiotics spread across different countries?

In terms of regional pockets where patent protection is being sought most frequently for these technologies, the US is in the lead, followed by JP and CN. The table below ranks top priority countries and helps provide an indication of where innovation in this area is originating:

Priority Country	Total No. of Records	Average No. of Fwd Cites per Patents	No. of Filings in last 5 yrs vs. Average of Top 20 Priority Country	Filing Year Range	Top 5 Assignees	Top 5 Inventors
US	2658 (24.2%)	4.59		1945-2011	NESTLE S.A.(78) KRAFT FOODS INC(64) DANISCO A/S(60) PROCTER AND GAMBLE CO(42) OSPREY BIOTECHNICS INC.(42)	ZHU QUINN QUN(20) SUNVOLD GREGORY DEAN(18) GRANT E DUBOIS(18) FARMER SEAN(18) INDRA PRAKASH(18)
JP	1475 (13.5%)	2.39		1961-2011	YAKULT HONSHA CO. LTD.(92) AJINOMOTO CO. INC.(58) CALPIS CO LTD(56) MEIJI CO. LTD.(44) MORINAGA MILK INDUSTRY CO. LTD.(38)	MASUYAMA AKIHIRO(23) AKAHOSHI RYOICHI(23) TAKANO TOSHIAKI(18) NISHIUCHI HIROAKI(17) MIYAKE TOSHIO(16)
CN	1101 (10%)	0.07		1986-2011	INNER MONGOLIA AGRICULTURAL UNIVERSITY(16) INNER MONGOLIA MENGNIU DAIRY INDUSTRY GROUP CO(16) ZHAO MIN(15) NANJING UNIVERSITY(14) SHANGHAI JIAOTONG UNIVERSITY(13)	HEPING ZHANG(18) AIMEI LI(17) MIN ZHAO(17) CHAO JIANG(11) YUE JIANG(11)
GB	537 (4.9%)	2.81		2011	DANISCO A/S(41) MARS INC.(22) AKZO NOBEL N.V.(21) NESTLE S.A.(16) CLASADO INC(15)	ESTELL DAVID A(12) GIBSON GLENN R(11) MORGAN ANDREW JOHN(10) TZORTZIS GEORGIOS(9) BARTON JOHN EDWARD DUNCAN(8)
FR	519 (4.7%)	2.79		1957-2011	GROUPE DANONE S.A.(73) INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE(29) SANOFI AVENTIS SPA(25) SOCIETE INDUSTRIELLE LIMOUSINE D APPLICATION BIOLOGIQUE SILAB(12) ADISSEO FRANCE S A S(11)	PAUFIQUE JEAN JACQUES(15) FAURIE JEAN MICHEL(9) POSTAIRE ERIC(8) LEGRAND CHARLES(8) ROUSSEL EDMOND(8)

KR	515 (4.7%)	0.53		1975-2011	YAKULT HONSHA CO. LTD.(12) PL BIO CO LTD(12) KOREA FOOD RESEARCH INSTITUTE(10) CJ CORP.(10) INDUSTRY-ACADEMIC CORPORATION FOUNDATION KEIMYUNG UNIVERSITY(6)	KIM DONG HYUN(10) LEE IN SEON(9) PARK YONG HA(9) LEE YEON HUI(7) PAEK KYUNG SOO(6)
DE	458 (4.2%)	2.37		2011	BASF AG(35) SUDZUCKER AG(25) SANOFI AVENTIS SPA(15) HENKEL & CIE GMBH(15) SUD-CHEMIE AG(11)	LOHSCHEIDT MARKUS(17) HARZ HANS PETER(15) BECK CHRISTINE(15) KOWALCZYK JORG(13) KLEIN DANIELA(11)
RU	362 (3.3%)	0.19		1993-2011	ZAKRYTOE AKTSIONERNOE OBSHCHESTVO KUL(17) FEDERALNOE GOSUDARSTVENNOE UCHREZHDENIE NAUKI MOSKOVSKIJ NAUCHNO ISSLEDOVATELSKIJ INSTITUT EHPIDEMIOLOGII I MIKROBIOLOGII IM G N GABRICHEVSKOGO FEDERALNOJ SLUZHBY PO NADZORU V SFERE ZASHCHITY PRAV POTREBITELEJ I BLAGOPOLUCHIJA CHELOVEKA(11) GOSUDARSTVENNOE OBRAZOVATEL NOE UCHREZHDENIE ASTRAKHANSKIJ GOSUDARSTVENNYJ UNIVERSITET GOU VPO AGU(11) FEDERAL NOE GOSUDARSTVENNOE OBRAZOVATEL NOE UCHREZHDENIE VYSSHEGO PROFESSIONAL NOGO OBRAZOVANIJA NOVOSIBIRSKIJ GOSUDARSTVENNYJ AGRARNYJ UNIVERSITET(6) AKTSIONERNOE OBSHCHESTVO ZAKRYTOGO TIPA(6)	LEVCHENKO TAT JANA ALEKSANDROV(15) AMERKHANOVA ADELAIDA MIKHAJLOV(13) LJANNAJA ALLA MIKHAJLOVNA(12) PETENKO ALEKSANDR IVANOVICH(8) BAJBAKOV VLADIMIR IVANOVICH(8)
AU	239 (2.2%)	1.38		1973-2011	COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION(22) THE UNIVERSITY OF NEW SOUTH WALES(13) DSM N.V.(13) ARNOTTS BISCUITS LTD(13) GOODMAN FIELDER INGREDIENTS LTD(12)	CONWAY PATRICIA LYNNE(28) CLANCY ROBERT LLEWELLYN(17) PANG GERALD(17) WANG XIN(15) BROWN IAN L(12)

IT	201 (1.8%)	2.61		1962-2011	PROBIOTICAL S.P.A.(12) ANIDRAL S.R.L.(9) STROZZI GIAN PAOLO(7) CONSIGLIO NAZIONALE DELLE RICERCHE(6) MOGNA LUCA(5)	MOGNA GIOVANNI(19) STROZZI GIAN PAOLO(19) MOGNA LUCA(10) MORELLI LORENZO(9) BOTTAZZI VITTORIO(7)
SE	161 (1.5%)	1.88		1960-2010	PROBI AB(35) SCA HYGIENE PRODUCTS AB(10) LYCKEBY STARKELSEFORADLING AB(7) ELLEN AB(5) MEDIPHARM AB(5)	AHRNE SIV(9) JEPPSSON BENGT(9) JOHANSSON MARIE LOUISE(9) SAMUELSSON ANNE CATHRINE(9) RUNEMAN BO(8)
DK	151 (1.4%)	2.4		1981-2011	CHR. HANSEN A/S(49) NOVOZYMES INC(24) NOVO NORDISK A S(24) DANISCO A/S(9) CARLSBERG A/S(5)	SCHULEIN MARTIN(14) BJOERNVAD MADS ESKELUND(10) SCHNORR KIRK(9) NILSSON DAN(9) ANDERSEN LENE NONBOE(8)
CH	113 (1%)	5.17		2010	NESTLE S.A.(34) BIRS BETEILIGUNGS UND VERWALTUNGSGESELLSCHAFT AG(10) BASF AG(8) BRAUEREI FELDSCHLOESSCHEN(4) BIRS BRIT AG(4)	WOOD ROBERT DUSTAN(14) BERROCAL RAFAEL(7) HOSE HUGH(7) DAC THANG HO(7) HO DAC THANG(6)

How we did it?

In order to compress all the information into a single report, we used the 360 ° series of reports available in the software. From the Priority Country 360° report options, we selected the priority countries and the different pieces of information we wanted to include in the singular display and then ran the report. The generated report was then exported to Excel using the option provided for the same.

Assignee - Key Statistics

Here we summarize key parameters of Top 15 Assignees such as filing trend, Avg. number of Forward citations per record, Top inventors in each Assignee, Top Co-Assignees and Coverage of underlying patent families

Assignee	Total No. of Records	Average No. of Fwd Cites per Patents	Filing Trend (Absolute)	Filing Year Range	Key Inventor (Top 5)	Co-Assignees	Coverage (Includes families)					
							US	EP	WO	JP	DE	FR
NESTLE S.A.	547 (5%)	2.16		1977-2011	ROCHAT FLORENCE(46) SCHIFFRIN EDUARDO(35) NEESER JEAN RICHARD(34) MOLLET BEAT(31) RENIERO ROBERTO(27)	INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE(3) SILICON VALLEY BANK(1)	4	16	38	1	1	0
DANISCO A/S	138 (1.3%)	1.68		1988-2011	ESTELL DAVID A(12) WARD MICHAEL(10) JONES BRIAN E(9) WEYLER WALTER(9) CLARKSON KATHLEEN A(8)	FINNFEEDS INTERNATIONAL LTD(2) KIRIN BREWERY CO. LTD.(1) NEDWIN GLENN E(1) RHODIA GROUP(1) SHARMA VIVEK(1)	1	3	9	0	1	1
DSM N.V.	126 (1.1%)	3.6		1975-2011	BIJL HENDRIK LOUIS(14) SCHAAP ALBERT(12) CONWAY PATRICIA LYNNE(9) WANG XIN(9) HARDER ABRAHAM(9)	ARNOTTS BISCUITS LTD(9) BURNS PHILP AND CO LTD(9) COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION(9) GOODMAN FIELDER INGREDIENTS LTD(9) THE UNIVERSITY OF NEW	0	5	14	1	1	0

						SOUTH WALES(9)						
UNILEVER N.V.	120 (1.1%)	2.58		1980-2010	LEDEBOER ADRIANUS MARINUS(25) SANDERS JAN WILLEM(13) VERRIPS CORNELIS THEODORUS(10) BODOR JANOS(8) BECKMANN CHRISTOPH HENDRIK(8)	AVRAMIS CONSTANTINA AVRAMOPOULOU(1) GIVAUDAN S.A.(1) LAURENCE BELLISSEN(1)	3	5	4	2	1	0
YAKULT HONSHA CO. LTD.	112 (1%)	4.28		1968-2009	AKAHOSHI RYOICHI(23) ISHIKAWA FUMIYASU(15) HASHIMOTO SHINJI(12) KUDO TATSUYUKI(9) MUTAI MASAHIKO(9)	NITTA GELATIN INC(1)	1	1	1	21	1	0
CHR. HANSEN A/S	107 (1%)	3.61		1958-2011	NILSSON DAN(12) KRINGELUM BOERGE(12) FLAMBARD BENEDICTE(10) JANZEN THOMAS(9) JOHANSEN ERIC(7)	NOVOZYMES INC(4) BIOTEKNOLOGISK INSTITUT(2) HUSEK VLADIMIR ING CSC(1) WADSKOV HANSEN STEEN LYDERS LERCHE(1)	4	3	19	0	1	0
GROUPE DANONE S.A.	103 (0.9%)	1.08		1995-2011	FAURIE JEAN MICHEL(12) POSTAIRE ERIC(11) CAYUELA CHANTAL(9) GARAULT PEGGY(9) DEGIVRY MARIE CHRISTINE(8)	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS(2) CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS(2) PIERRE FABRE MEDICAMENT(1)	1	1	3	0	0	2

BASF AG	68 (0.6%)	2.62		1972-2011	LOHSCHEIDT MARKUS(19) BECK CHRISTINE(15) HARZ HANS PETER(15) LEEMANN MARTIN(11) KLEIN DANIELA(11)	FEUSSNER IVO(1) GEWEHR MARKUS(1) GIPMANS MARTIJN(1) GLADWIN ROBERT JOHN(1) HORNUNG ELLEN(1)	0	3	2	0	2	0
KRAFT FOODS INC	66 (0.6%)	9		1969-2009	MORAN JAMES WILLIAM(9) NAUTH KAISER RAJINDER(8) ZHENG ZUOXING(7) MEHNERT DAVID WEBB(7) ROMAN MICHAEL G(6)	No Co-Assignee Present	3	0	0	0	0	0
AJINOMOTO CO. INC.	65 (0.6%)	3.72		1968-2009	NISHIUCHI HIROAKI(17) NISHIMURA YASUSHI(13) SUGIMOTO REIKO(8) OKAMURA HIDEKI(8) SUEHIRO MARIKO(6)	ITO MASAHARU(1) OBIHIRO UNIVERSITY OF AGRICULTURE AND VETERINARY MEDICINE(1) YAMAMOTO KENJI(1)	1	5	2	8	0	0
GIVAUDAN S.A.	63 (0.6%)	3.98		1989-2010	VEDAMUTHU EBENEZER R(9) HOOGLAND MARTIN(9) BHOWMIK TARUN(6) MYAKA STEFKA(6) MUSTERS WOUTER(5)	BINGGELI EVA CHRISTINA MARIA(1) HEIJMEN VINCENT H(1) KEULTJES ROB B(1) MUENCH THOMAS(1) UNILEVER N.V.(1)	0	2	3	1	0	0
SANOFI AVENTIS SPA	59 (0.5%)	3.2		1956-2008	MANCY DENISE(7) NINET LEON(7) PREUD HOMME JEAN(6) SCHWARTZ ROBERT D(5) BODIE ELIZABETH A(4)	No Co-Assignee Present	5	1	0	0	4	6

CALPIS CO LTD	56 (0.5%)	4.66		1971-2011	MASUYAMA AKIHIRO(22) TAKANO TOSHIAKI(18) YAMAMOTO NAOYUKI(11) NAKAMURA TEPPEI(8) SHINODA TADASHI(7)	No Co-Assignee Present	0	1	0	3	0	0
OSPREY BIOTECHNICS INC.	54 (0.5%)	4.19		1975-1991	VEDAMUTHU EBENEZER R(10) GONZALEZ CARLOS F(9) MATROZZA MARK A(9) GRYCZKA ALFRED J(8) KUNKA BLAIR S(7)	No Co-Assignee Present	9	0	0	0	13	0
FRIESLANDCAMPINA N.V.	50 (0.5%)	1.82		1987-2010	GLAS CORNELIS(8) NAUTA ARJEN(7) KLEEREBEZEM MICHIEL(7) KOK JAN(6) MIERAU IGOR(6)	INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE(1)	0	10	5	0	3	0

How we did it?

From the Assignee 360° report options, we selected Top 15 Assignees and the different pieces of information we wanted to include in the singular display and then ran the report. The generated report was then exported to Excel using the option provided for the same.

Companies new in this Technology Space

The table below shows key companies actively involved in last 3 years.

Assignee	First Filed in	No of Records filed till date
ZHAO MIN	2008	15
MILCOM A S	2009	5
GREAT BIOLOGY PHATMACHEUTICAL TIANJIN CO	2010	4
GUANGDONG INSTITUTE OF MICROBIOLOGY	2009	4
HERO NUTRITIONALS LLC	2010	4
AGRICULTURE VICTORIA SERVICES PTY LTD	2009	3
ANGEL YEAST CO LTD	2009	3
HEFEI UNIVERSITY OF TECHNOLOGY	2009	3
IMAGILIN TECHNOLOGY LLC	2009	3
JIANGSU ACADEMY OF AGRICULTURAL SCIENCES	2009	3
PITNEY BOWES INC.	2009	3
SHANDONG DUOLIDE BIO TECHNOLOGY CO	2009	3
TRUSTEES OF DARTMOUTH COLLEGE	2009	3
UNIVERSIDAD DE CONCEPCION	2010	3
YANGZHOU CHENGLU ENVIRONMENTAL ENGINEERING CO	2009	3
AGRAQUEST INC	2009	2
ALSIANO A S	2009	2
ANHUI BAISHI QINGYUAN FOOD CO	2010	2
BEIJING ZHONGSHENG JINYU DIAGNOSTIC TECHNOLOGY CO	2009	2
BLUE GREEN MARINE LIMITED	2009	2
CHANGCHUN INSTITUTE OF TECHNOLOGY	2010	2
GRAAL SRL	2010	2
HIGHMARK RENEWABLES RESEARCH LIMITED PARTNERSHIP	2009	2
INDUSTRY ACADEMY COOPERATION CORPS OF SUNCHON NATIONAL UNIVERSITY	2009	2
INHA INDUSTRY PARTNERSHIP INSTITUTE	2009	2
JILIN BOJIA WATER QUALITY TECHNOLOGY SERVICE CO	2010	2
NINGBO UNIVERSITY	2009	2
AGRIVIDA INC	2011	1
ANLIT LTD	2011	1
ARAGAN	2011	1
ARIZONA TECHNOLOGY ENTERPRISES	2011	1
BIOPET LTD	2011	1
BUCKMAN LABORATORIES INTERNATIONAL INC.	2011	1

How we did it?

From the reports dashboard option, we selected the number of new and distinct assignees appearing in the landscape in the last couple of years i.e., 2008-2011. The assignees of respective years were exported to excel and the results were arranged in increasing order of the records most filed.

Inventor - Key Statistics

Here we summarize key parameters of Top 15 Inventors such as filing trend, average number of forward citations per record, key associated companies and top 5 co-inventors.

Inventor	Total No. of Records	Average No. of Fwd Cites per Patents	Filing Trend (Absolute)	Filing Year Range	Key Assignees (Top 5)	Co-Inventors
ROCHAT FLORENCE	46 (0.4%)	4.7		1992-2010	NESTLE S.A.(46)	RENIERO ROBERTO(11) NEESER JEAN RICHARD(10) SERVIN ALAIN(10) SCHIFFRIN EDUARDO(9) BLUM SPERISEN STEPHANIE(8)
SCHIFFRIN EDUARDO	36 (0.3%)	4.97		1992-2010	NESTLE S.A.(35) NOKIA CORPORATION(1)	ROCHAT FLORENCE(9) HASCHKE FERDINAND(8) BRASSART DOMINIQUE(6) PEREZ PABLO(6) CAVADINI CLAUDE(5)
NEESER JEAN RICHARD	34 (0.3%)	5.12		1992-2005	NESTLE S.A.(34)	SERVIN ALAIN(12) RENIERO ROBERTO(10) ROCHAT FLORENCE(10) BRASSART DOMINIQUE(9) DONNET ANNE(5)
CONWAY PATRICIA LYNNE	32 (0.3%)	3.59		1995-2009	THE UNIVERSITY OF NEW SOUTH WALES(11) ARNOTTS BISCUITS LTD(10) BURNS PHILP AND CO LTD(10) COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION(10) GOODMAN FIELDER INGREDIENTS LTD(10)	WANG XIN(15) BROWN IAN L(12) MCNAUGHT KENNETH J(8) CLANCY ROBERT LLEWELLYN(6) LUCAS RACHEL JANE(6)
MOLLET BEAT	31 (0.3%)	1.61		1992-2008	NESTLE S.A.(31)	GERMOND JACQUES EDOUARD(17) MARCISET OLIVIER(7) HOTTINGER HERBERT(6) MIGNOT OLIVIER(6) LAPIERRE LUCIANE(5)

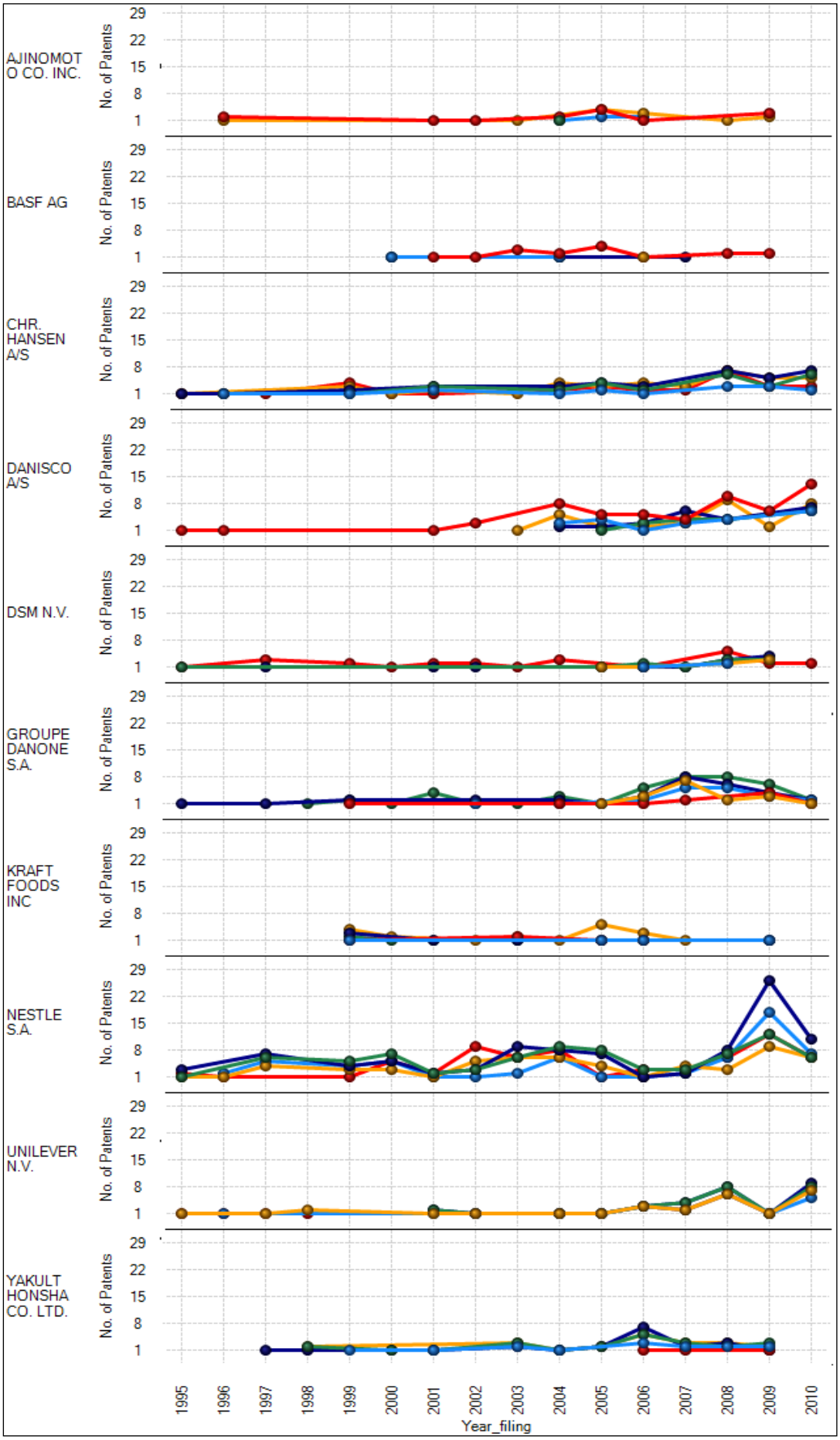
COLLINS JOHN KEVIN	29 (0.3%)	2.41		1998-2011	ALIMENTARY HEALTH LTD(15) ENTERPRISE IRELAND(7) NATIONAL UNIVERSITY OF IRELAND CORK(5) UNIVERSITY COLLEGE CORK(2) PROCTER AND GAMBLE CO(2)	O SULLIVAN GERALD C(22) SHANAHAN FERGUS(20) KIELY BARRY(18) O MAHONY LIAM D(16) OMAHONY LIAM(7)
LEDEBOER ADRIANUS MARINUS	29 (0.3%)	1.52		1993-2008	UNILEVER N.V.(25) GIVAUDAN S.A.(3) SANDERS JAN WILLEM(1) COOKE DAVID(1) FOSTER TIMOTHY JOHN(1)	ALBERS RUUD(7) FRENKEN LEO GERARDUS J(7) VREEKER ROBERT(6) BRUL STANLEY(5) HAMMARSTROM LARS GORAN LENNART(5)
KIELY BARRY	27 (0.2%)	0.96		2001-2011	ALIMENTARY HEALTH LTD(18) PROCTER AND GAMBLE CO(4) KIELY BARRY PIUS(4) O MAHONY LIAM DIARMUID(4) BOILEAU THOMAS WILLIAM MAXWELL(3)	O MAHONY LIAM D(20) COLLINS JOHN KEVIN(18) SHANAHAN FERGUS(15) O SULLIVAN GERALD C(13) BOILEAU THOMAS W(7)
O MAHONY LIAM D	27 (0.2%)	2		2000-2011	ALIMENTARY HEALTH LTD(12) PROCTER AND GAMBLE CO(5) O MAHONY LIAM DIARMUID(4) ENTERPRISE IRELAND(4) NATIONAL UNIVERSITY OF IRELAND CORK(4)	KIELY BARRY(20) COLLINS JOHN KEVIN(16) SHANAHAN FERGUS(14) O SULLIVAN GERALD C(11) BOILEAU THOMAS W(7)
RENIERO ROBERTO	27 (0.2%)	2.26		1998-2010	NESTLE S.A.(27)	ROCHAT FLORENCE(11) NEESER JEAN RICHARD(10) BRUESSOW HARALD(8) ZINK RALF(8) SERVIN ALAIN(7)
MOGNA GIOVANNI	26 (0.2%)	0.04		2002-2011	PROBIOTICAL S.P.A.(13) ANIDRAL S.R.L.(11) MOGNA GIOVANNI(7) STROZZI GIAN PAOLO(7) MOGNA LUCA(5)	STROZZI GIAN PAOLO(22) MOGNA LUCA(9) BRUNO FEDERICO(2) DRAGO LORENZO(1) MORELLI LORENZO(1)

STROZZI GIAN PAOLO	25 (0.2%)	0.08		2002-2011	PROBIOTICAL S.P.A.(15) ANIDRAL S.R.L.(10) STROZZI GIAN PAOLO(9) MOGNA LUCA(7) MOGNA GIOVANNI(7)	MOGNA GIOVANNI(22) MOGNA LUCA(12) DRAGO LORENZO(1) MORELLI LORENZO(1) PANE MARCO(1)
GERMOND JACQUES EDOUARD	24 (0.2%)	1.25		1994-2009	NESTLE S.A.(24)	MOLLET BEAT(17) FRITSCHE RODOLPHE(5) LAPIERRE LUCIANE(5) CORTHESY BLAISE(4) HOTTINGER HERBERT(3)
WOOD ROBERT DUSTAN	24 (0.2%)	4.29		1988-2004	NESTLE S.A.(23) GIVAUDAN S.A.(1)	HOSE HUGH(10) DAC THANG HO(7) HO DAC THANG(6) HEYLAND SVEN(5) BAJRACHARYA RUPAK(4)
AKAHOSHI RYOICHI	23 (0.2%)	3.48		1989-2008	YAKULT HONSHA CO. LTD.(23) NITTA GELATIN INC(1)	KUDO TATSUYUKI(9) OGASAWARA NOBUHIRO(8) HASHIMOTO SHINJI(6) MATSUI AKIHISA(6) KUMA YOSHIHARU(5)

How we did it?

From the Inventor 360° report options, we selected the different pieces of information we wanted to include in the singular display and then ran the report. The generated report was then exported to Excel using the option provided for the same.

Microbe Filing Trends across Top Ten Assignees



Microbes

- Lactobacillus Acidophilus
- Lactobacillus Casei
- Lactococcus Lactis
- Lactobacillus Plantarum
- Escherichia Coli

Number of records refers to the absolute number of filings per microbe per Assignee.

By analyzing the patent filing trends from 1995 it's evident Lactococcus Lactis is being widely used by Unilever N.V. Danisco A/S actively got into patents 2003 onwards.

How we did it?

We used the categories created and using the co-occurrence analyzer, we generated a 4-D matrix containing Assignee, microbe types, Filing Years and Number of Records. We then filtered top ten assignees and also restricted the results to patents filed from 1995 to 2011. This resulting matrix was then converted into a chart.

Probiotics - Microbes vs. Application Areas

Which microbes are used across various application areas across Probiotics?
As can be seen in the table below microbe "Lactobacillus Acidophilus" has been used in Gastrointestinal Tract. Also, microbe "Bifidobacterium Lactis" hasn't been used in "oral cavity". Such an indication can be further verified via patent search to confirm existence of a white space.

Microbes (Rows) / Applications (Column)	Total	Lactobacillus Acidophilus	Lactococcus Lactis	Bacillus Coagulans	Lactobacillus Johnsonii	Lactobacillus Casei	Lactobacillus Rhamnosus	Bifidobacterium Infantis	Lactobacillus Helveticus	Lactobacillus Plantarum	Escherichia Coli	Saccharomyces Boulardii	Bifidobacterium Lactis	Bifidobacterium Breve	Lactobacillus Paracasei	Lactobacillus Reuteri
Total	1758	835	422	135	251	658	506	497	273	628	877	138	376	429	118	375
Medical Applications	1604	779	359	122	244	613	485	480	246	571	814	137	359	413	113	359
- Gastrointestinal Tract	805	447	173	66	129	334	247	276	121	317	420	77	198	241	71	184
- Immune Function and Infections	747	347	178	50	109	291	241	213	101	254	480	59	168	183	62	167
- Inflammation	601	285	124	41	92	237	186	183	72	216	384	64	142	146	46	128
- Allergic Conditions	205	93	52	17	46	98	82	83	27	76	88	17	71	69	25	56
- Skin Improvement	199	102	47	25	47	86	74	71	35	74	94	13	54	61	17	51
- Diarrhea	174	90	36	16	29	82	58	68	20	61	107	29	49	50	17	56
- Cancer	142	69	28	7	21	63	40	55	13	55	80	20	35	43	3	34
- Diabetes Mellitus	107	55	25	9	24	59	43	56	13	43	40	17	42	49	9	34
- Immunomodulation Therapy	71	43	27	3	15	44	24	28	14	33	43	11	19	20	5	21
- Cholesterol	67	39	17	7	10	29	18	20	13	29	21	4	11	23	1	13
- Blood Pressure	66	31	14	9	10	29	21	30	23	22	25	11	19	25	3	15
- Lactose Intolerance	65	44	25	21	9	33	23	23	22	29	21	7	15	21	2	16

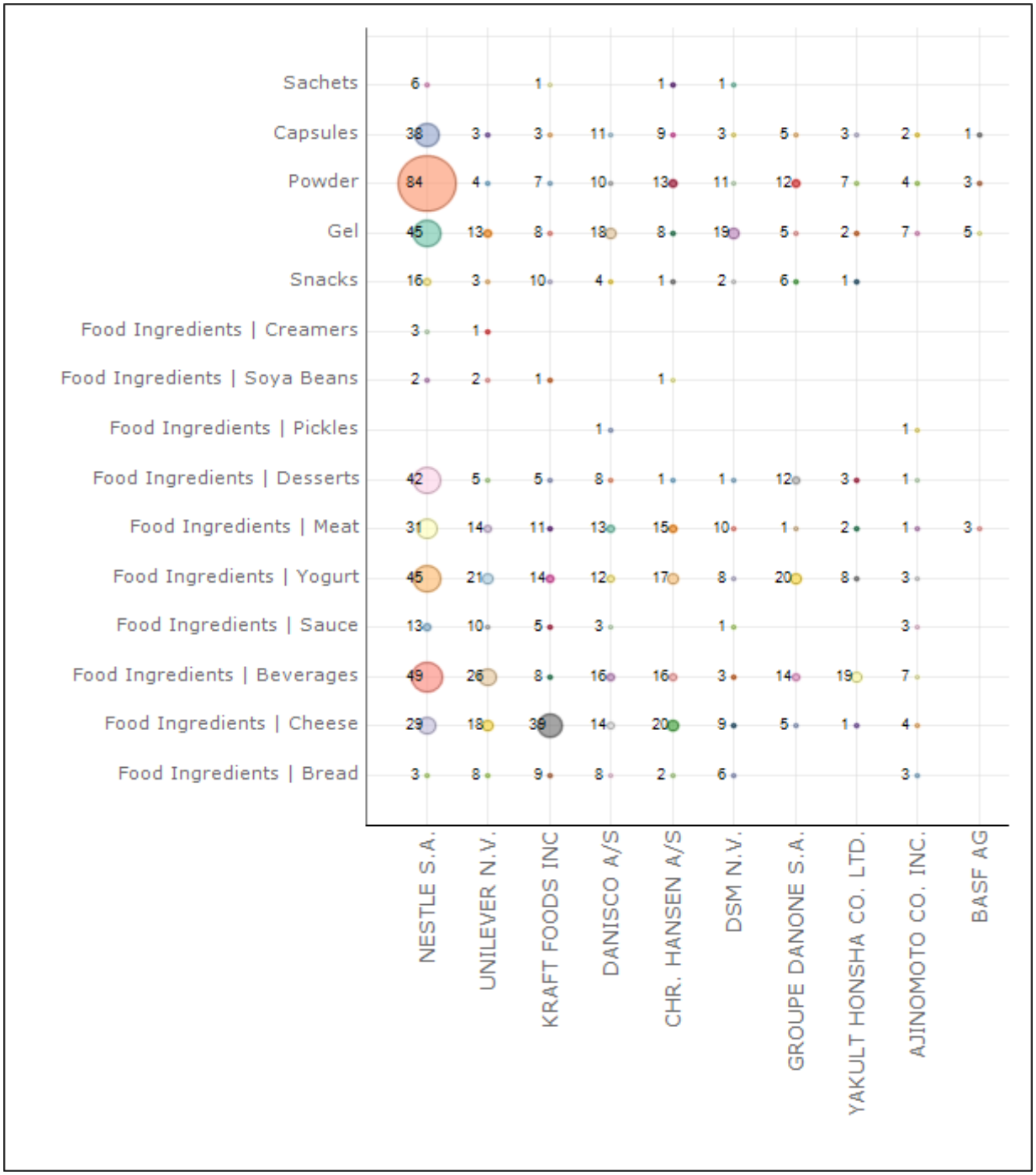
- Helicobacter Pylori	47	25	12	3	9	21	17	10	5	21	33	3	10	12	4	8
- Oral Cavity	26	13	8	2	5	13	6	5	4	8	14	1		2	1	4
Aqua Culture	204	94	45	21	13	68	38	37	32	73	105	8	34	27	14	28
Bacteriocins	126	42	89	13	14	31	22	20	29	58	65	2	14	15	8	14

How we did it?

The clusters of microbe types and application areas that were created for the previous analysis were correlated using the co-occurrence analyzer and then the resulting matrix was exported to Excel using the option provided for the same.

Key Assignees vs. Formulations

Which assignees hold the maximum inventions across different formulations?



Nestle S.A. dominates patent holdings for “Powder” with 84 patent records classified under this application area. For ingredients related to Bread, Kraft Foods Inc. heads the assignees with 39 patents

How we did it?

The clusters that were created for the previous analysis were correlated using the co-occurrence analyzer and then the resulting matrix was converted into a bubble chart.

Assignee Portfolio spread across different Processing Technologies

Processing Technologies (Rows) / Key Assignees (Columns)	Total	Fermentation	Pasteurization	Centrifugation	Sterilization	Homogenization	Ultrafiltration	Lyophilization	Pulse Electric Field	Pascalization
Total	1409	1273	462	614	479	440	227	325	16	5
NESTLE S.A.	320	273	136	86	93	127	28	61	3	1
DANISCO A/S	98	95	26	53	34	14	23	32	1	
UNILEVER N.V.	95	88	59	40	35	45	19	23	5	
YAKULT HONSHA CO. LTD.	89	86	6	26	41	34	6	16	2	1
CHR. HANSEN A/S	79	75	29	49	24	24	5	26	1	1
GROUPE DANONE S.A.	74	74	47	24	14	28	16	16		
DSM N.V.	73	66	23	37	15	14	21	13		
AJINOMOTO CO. INC.	43	41	6	23	26	4	6	1		
KRAFT FOODS INC	42	41	31	17	7	19	21	12		2
MEIJI CO. LTD.	41	41	1	23	27	13	3	5	1	
N.V. NUTRICIA	39	37	11	15	18	17	8	6	2	
COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH	39	30	4	26	16	3	5	4		
NOVOZYMES INC	38	36	10	32	14	15	19	7		

CALPIS CO LTD	38	37	8	23	14	11	4	14		
PROCTER AND GAMBLE CO	36	33	4	16	2	8		13		
OSPREY BIOTECHNIC S INC.	34	34	9	17	8	1	6	24		
IAMS CO	34	12		15	12	28		5		
BASF AG	33	31	10	19	15	8	15	8		
GIVAUDAN S.A.	32	32	13	16	15	2	5	9		
MORINAGA MILK INDUSTRY CO. LTD.	29	28	2	10	21	9	5	4		
SANOFI AVENTIS SPA	28	22	3	6	7	2	1	6		
FRIESLANDC AMPINA N.V.	26	22	14	13	4	8	6	6	1	
INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQ UE	23	21	7	17	8	5	4	7		
MARS INC.	17	10	7	8	7	5	2	2		
PIONEER HI BRED INTERNATIO NAL INC	14	13		6	5	1		5		

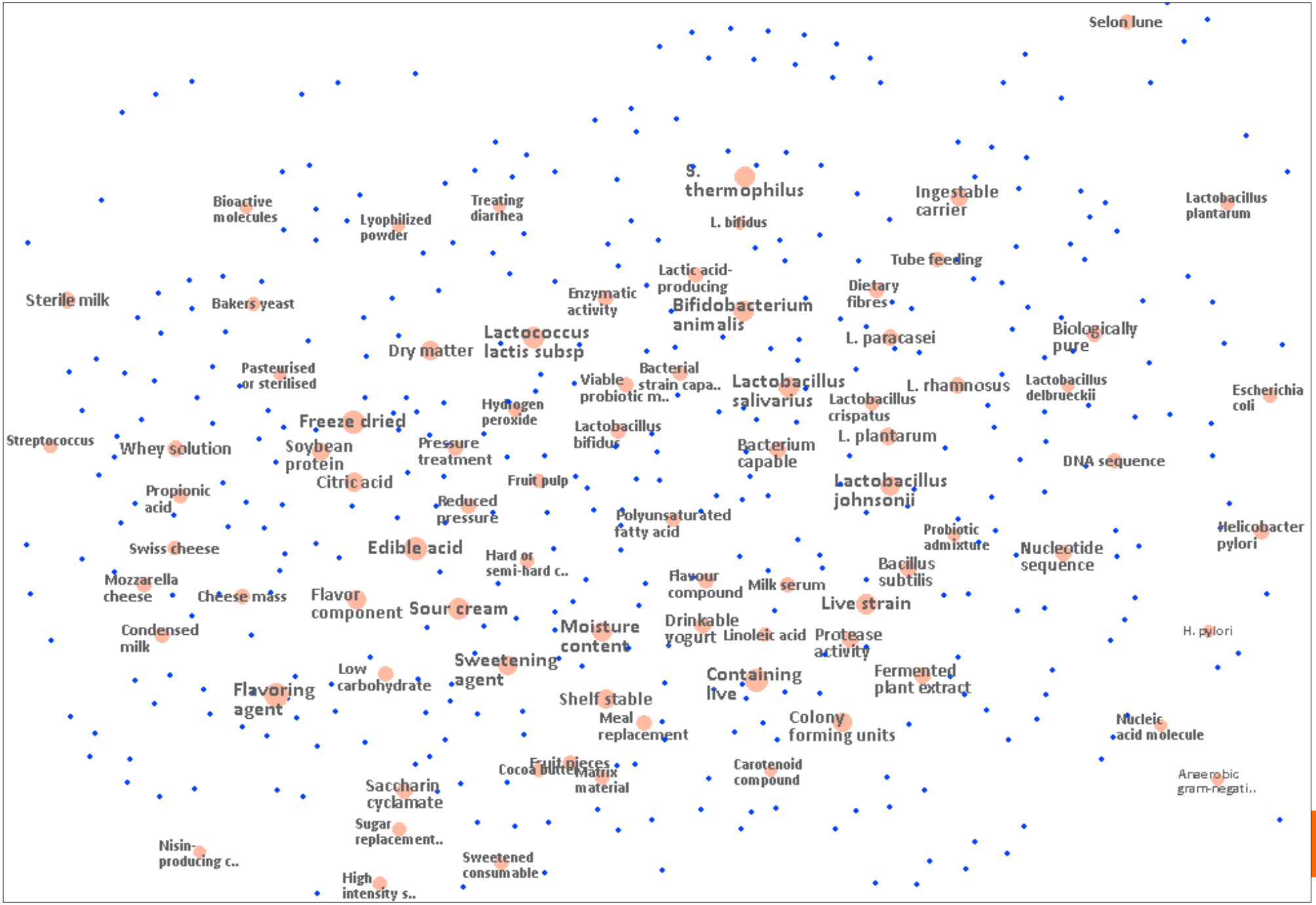
From the analysis, it's clear that Pulse Electric Field is an upcoming food processing technology which is yet to be exploited by majority of the companies.

How we did it?

First the various processing technologies were identified by online research. Then by using a combination of semantic analysis tools such as the clustering tools and searching tools available in Patent iNSIGHT Pro, patents were categorized under the different processing technologies. A co-occurrence matrix was generated to map the processing technologies with the assignees to identify which assignees hold the strongest portfolios in which

processing technologies. The matrix was filtered for the top 25 assignees and then the resulting matrix was exported to Excel using the option provided for the same.

Technology Landscape for patents in Yogurt Food Product



The above map shows the landscape of key sub technologies appearing in patents related to Yogurt food product. The blue dots represent patents and the topics are clustered together based on common patents shared. This way related topics appear together.

How we did it?

Automatic clustering was applied over the Title, Abstract and Claims portion of patents in the Yogurt formulation.
The cluster setting was set to extract finer topics so as to extract deeper and otherwise hidden topics.
The above chart was then generated using the cluster landscape option in Vizmap tool of the software.

Appendix A: Key Assignee Normalization Table

Note: The tables below include normalization from US Assignments database and so some assignees may appear under multiple normalized names.

NESTLE S.A

CM&D PHARMA LIMITED
DES PRODUITS NESTLE SOC
INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE SOCIETE DES PRODUITS NESTLE S A
NESTLE SA SOC ASS TECH PROD
SOCIEDADE DES PRODUITS NESTLE

DANISCO A/S

DANISCO BIOTEKNOLOGI AS
GENENCOR INC
CULTOR OY
MORGAN ANDREW JOHN
VROEMEN CASPER WILLEM

KRAFT FOODS INC.

GEN FOODS INC
KRAFT FOODS HOLDINGS INC
KRAFT GENERAL FOODS INC
NABISCO BRANDS INC
RAYMOND GOODRICH MEGAN N
DIAS BENJAMIN EMANUEL

UNILEVER N.V.

BESTFOODS DE GMBH AND CO OHG
HINDUSTAN UNILEVER LTD
CONOPCO INC
CPC INTERNATIONAL INC
BERGH FOODS CO

YAKULT HONSHA CO. LTD.

KABUSHIKI KAISHA YAKULT HONSHA
KABUSHIKI KASIHA YAKULT HONSHA
KOREA YAKULT CO LTD
NITTA GELATIN KK
TOKYO YAKULT SEIZO CO LTD
YAKULT HONSHA KK
YAKULT MATERIAL CO LTD
YAKURTO HONSHA CO LTD
YAKURUDO HONSHA CO LTD

Appendix B: Search Strings Used for Categorization

Categorization: Processing Technologies

1. Centrifugation

Centrifugation	
(FT) contains (centrifug*)	2289 results

2. Fermentation

Fermentation	
(FT) contains (zymolog* or zymurgy or ferment*)	5348 results

3. Homogenization

Fermentation	
(FT) contains (homogeni*)	1296 results

4. Lyophilization

Lyophilization	
(FT) contains (lyophili* or (freeze% w/2 (dry* or dried*)))	1471 results

5. Pascalization

Pascalization	
(FT) contains (pascali* or bridgman* or ("high pressure" w/2 process*))	20 results

6. Pasteurization

Pasteurization	
(FT) contains (pasteur*)	1249 results

7. Pulse Electric Field

Pulse Electric Field	
(FT) contains (pulse* w/3 field*)	43 results

8. Sterilization

Sterilization	
(FT) contains (sterili*)	1937 results

9. Ultrafiltration

Ultrafiltration	
(FT) contains (ultrafilt* or (ultra w/3 filt*) or (membrane w/2 filt*))	658 results

Categorization: Applications

1. Aqua Culture

Aqua Culture	
(TAC) contains (fish* or crustacean* or mollusc* or shrimp* or oyster* or seaweed* or alga* or aqua* or carp or crab or conch or snail or urchin* or hyacinth)	690 results

2. Bacteriocins

Bacteriocins	
(TAC) contains (*bacteriocin* or acidocin* or actagardine* or agrocin* or alveicin* or aureocin* or carnocin* or carnocyclin* or colicin* or curvaticin* or divercin* or duramycin* or enterocin* or enterolysin* or epidermin* or gallidermin or erwiniocin* or glycinecin* or halocin* or haloduracin* or lactococin* or lacticin* or leucoccin* or macedocin* or mersacidin* or mesentericin* or mutacin* or nisin* or paenibacillin* or planosporicin* or pediocin* or pentocin* or plantaricin* or reutericin* or sakacin* or salivaricin* or subtilin* or sulfolobicin* or "thuricin 17" or trifolitoxin* or variacin* or vibriocin* or warnericin* or warnerin*)	184 results

Medical Applications

1. Allergic Conditions

Maintaining Allergic Conditions	
(TAC) contains (allerg* or ((gamma w/2 linolenic) w/2 acid) or GLA or (omega w/2 6) or omega6 or eicosapentaenoic* or EPA or (omega w/2 3) or omega3)	342 results

2. Blood Pressure

Blood Pressure	
(TAC) contains (cardiac* or hyperten* or (blood* w/2 pressur*))	119 results

3. Cancer

Cancer	
(TAC) contains (cancer* or (malignant w/3 neoplasm))	235 results

4. Cholestrol

Cholesterol	
(TAC) contains (cholestr*)	158 results

5. Diabetes Mellitus

Diabetes Mellitus	
(TAC) contains ((diabetes w/2 mellitus) or diabet*)	173 results

6. Diarrhea

Diarrhea	
(TAC) contains (diarr*)	275 results

7. Gastrointestinal Tract Impairment

Gastrointestinal Tract Impairment	
(TAC) contains ((gastro w/2 intestin*) or GI or gastrointestin* or stomach* or intestin* or bowel* or IBS or spasti*)	1503 results

8. Helicobacter Pylori

Helicobacter Pylori	
(TAC) contains ((helicobacter* or H. or campylobacter*) w/3 pylori*)	74 results

9. Immune Functions and Infections

Immune Functions and Infections	
(TAC) contains (infect* or immune* or pathogen*)	1296 results

10. Immunomodulation Therapy

Immunomodulation	
(TAC) contains (immunomodulat* or (immun* w/2 (therap* or treat*)))	100 results

11. Inflammation

Inflammation	
(TAC) contains (inflammat* or pathogen* or irrita* or exacerbat* or swell* or coliti*)	982 results

12. Lactose Intolerance

Lactose Intolerance	
(TAC) contains ((lactose w/2 intoler*) or lactase* or hypolactasia)	80 results

13. Oral Cavity

Oral Cavity	
(TAC) contains ((oral or mouth) w/3 (cavit* or disorder* or disease* or symptom*))	75 results

14. Skin Improvement

Skin Improvement	
(TAC) contains (skin* or rash* or derma*)	454 results

Categorization: Formulations

1. Capsules

Capsules	
(TAC) contains (capsule* or tablet or pill* or gelatin* or "gelcap" or (gel w/2 cap*) or "gelcaps")	713 results

2. Food Ingredients

a) Beverages

Beverages	
(TAC) contains (ttl to spec) contains (beverage* or juice* or "softdrink" or (soft w/2 drink*) or "buttermilk" or (butter w/2 milk))	994 results

b) Bread

Bread	
(TAC) contains (bread* or bun or dough* or pizza*)	315 results

c) Cheese

Cheese	
(TAC) contains (kwark or quark or gouda or ricotta or scamorza or bocconcini or mascarpone or cheese* or mozzarella or (sour w/2 cream*) or "sour cream" or oregano)	554 results

d) Creamers

Creamers	
(TAC) contains (whitener* or creamer*)	8 results

e) Desserts

Desserts	
(TAC) contains (dessert* or desert* or cake* or pastr* or "ice cream" or pie or pies or (ice w/2 cream*) or chocolate* or candy or candies or pudding* or custard* or sweetner*)	424 results

f) Meat

Meat	
(TAC) contains (meat or beef or pork or chicken* or lamb or fish* or mutton* or poultr* or ham or pepperoni or bacon or turkey or salami or sausage*)	954 results

g) Pickles

Pickles	
(TAC) contains (pickl*)	72 results

h) Sauce

Sauce	
(TAC) contains (((soy or soya) w/2 sauce*) or sauce*)	193 results

i) Soya Beans

Soya Beans	
(TAC) contains ((soy or soya) w/2 bean*)	73 results

j) Yogurt

Yogurt	
(TAC) contains ((yoghurt* or joghurt or yogurt* or yogourt* or tofu or curd* or yofu or ((soy or soya) w/2 yoghurt* or yofu or curd* or tofu or yogurt* or yogourt* or joghurt)))	722 results

3. Gel

Gel	
(TAC) contains (ttl to spec) contains (oil or paste or ointment* or lotion* or gel or jel or jell)	1107 results

4. Powder

Powder	
(TAC) contains (powder* or granuel* or granule*)	1317 results

5. Sachets

Sachets	
(TAC) contains (sachet* or packet* or pouch or pouches)	71 results

6. Snacks

Snacks	
(TAC) contains (biscuit* or cookie* or snack* or (pop w/2 corn*) or flake* or "popcorn" or crisps or pasta* or fries or (corn w/2 flake*) or "cornflake" or noodle* or sandwiches or sandwich or nacho* or chip*)	302 results

Categorization: Microbes

1. Bacillus Coagulans

Bacillus Coagulans	
(FT) contains ((bacill* w/5 coagulans or thermoacid* or dextrolacticus) or "B. coagulans" or (lactobacill* w/2 sporogene*))	256 results

2. Bifidobacterium Breve

Bifidobacterium Breve	
(FT) contains (bifidobacteri* w/3 breve*) or "B. Breve" or (lactobacill* w/3 bifidus))	640 results

3. Bifidobacterium Infantis

Bifidobacterium Infantis	
(FT) contains ((bifidobacteri* w/3 (infantis or longum) or "b. longum"))	781 results

4. Bifidobacterium Lactis

Bifidobacterium Lactis	
(FT) contains ((bifidobacteri* w/5 lactis) or "B. animalis" or "B. lactis")	578 results

5. Escherichia Coli

Escherichia Coli	
(FT) contains ((escherichi* w/3 coli) or "E. coli")	1412 results

6. Lactobacillus Acidophilus

Lactobacillus Acidophilus	
(FT) contains ((lactobacill* w/3 acidophil*) or "L. acidophilus")	1529 results

7. Lactobacillus Casei

Lactobacillus Casei	
(FT) contains ((lactobacill* w/3 casei) or "L. casei")	1201 results

8. Lactobacillus Helveticus

Lactobacillus Helveticus	
(FT) contains ("L. helveticus" or (lactobacill* w/3 helveticus))	564 results

9. Lactobacillus Johnsonii

Lactobacillus Johnsonii	
(FT) contains ((lactobacill* w/3 johnsonii) or "L. johnsonii")	372 results

10. Lactobacillus Paracasei

Lactobacillus Paracasei	
(FT) contains ((lactobacill* w/3 paracase) or "L. paracasei")	174 results

11. Lactobacillus Plantarum

Lactobacillus Plantarum	
(FT) contains ((lactobacill* w/3 plantarum) or "L. plantarum")	1075 results

12. Lactobacillus Reuteri

Lactobacillus Reuteri	
(FT) contains ("L. reuteri" or (lactobacill* w/5 (reuteri* or prodent*)))	590 results

13. Lactobacillus Rhamnosus

Lactobacillus Rhamnosus	
(FT) contains ("L. rhamnosus" or (lactobacill* w/3 rhamnosus))	771 results

14. Lactococcus Lactis

Lactococcus Lactis	
(FT) contains ((lactococcus w/3 lactis) or (streptococcac* or "L. lactis"))	799 results

15. Saccharomyces Boulardii

Saccharomyces Boulardii	
(FT) contains (((saccharomyce* or saccaromyce*) w/3 boulardii) or "S. boulardii")	187 results

Summary

The probiotics market is currently being driven by the rising popularity of probiotics functional foods and beverages among (F&B) consumers. Companies such as Yakult Honsha, Chr. Hansen, Nestle S.A. have developed patented strains of microorganisms claiming to affect specific health benefits; there has been a proliferation of probiotics ingredient manufacturers who develop strains of microorganisms for integrating with diverse set of products.

On the whole, the probiotics market represents a growing market for functional food suppliers and manufacturers, and product innovations will hold a key factor for increasing market share.

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Sources & References

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