

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
31 December 2003 (31.12.2003)

PCT

(10) International Publication Number
WO 2004/000340 A3

(51) International Patent Classification⁷: **A61K 35/74**,
A23L 1/03, 1/308

(21) International Application Number:
PCT/NL2003/000455

(22) International Filing Date: 20 June 2003 (20.06.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
02077460.0 20 June 2002 (20.06.2002) EP

(71) Applicant (*for all designated States except US*): **N.V. NUTRITICA** [NL/NL]; P.O.Box 1, NL-2700 MA Zoetermeer (NL).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **SPEELMANS, Gelske** [NL/NL]; Schuurhoven 25, NL-6721 SM Bennekom (NL). **KNOL, Jan** [NL/NL]; Johan Beenstraat 10, NL-6708 SM Wageningen (NL). **GOVERS, Maria, Johanna, Adriana, Petronella** [NL/NL]; Oude Bennekomseweg 10, NL-6706 EV Wageningen (NL).

(74) Agents: **VAN WESTENBRUGGE, Andries** et al.; Nederlandsch Octrooibureau, Scheveningsweg 82, P.O. Box 29720, NL-2502 LS The Hague (NL).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report:
25 March 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD AND COMPOSITION FOR PREVENTING OR ALLEVIATING SYMPTOMS OF MALABSORPTION FROM THE GASTROINTESTINAL TRACT

(57) Abstract: One aspect of the present invention relates to a method of preventing or alleviating symptoms of malabsorption in a monogastric mammal which malabsorption is caused by impaired intestinal digestion, said method comprising the enteral administration to said mammal of an effective amount of one or more strains of the genus *Propionibacterium* and/or a prebiotic that stimulates gastrointestinal activity of *Propionibacterium*. Another aspect of the invention relates to a dietary supplement comprising at least 106 metabolically active cells of the genus *Propionibacterium*; at least 0.5 g of a prebiotic and/or at least 106 metabolically active homofermentative cells of the genus *Lactobacillus* and/or at least 106 metabolically active cells of the genus *Bifidobacterium*; and a nutritionally acceptable carrier.



WO 2004/000340 A3

INTERNATIONAL SEARCH REPORT

Internatio...lication No
PCT/NL 03/00455

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61K35/74 A23L1/03 A23L1/308

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A61K A23L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, MEDLINE, WPI Data, PAJ, FSTA

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A Y X	US 6 077 504 A (SIMONE CLAUDIO DE ET AL) 20 June 2000 (2000-06-20) claims 1,5,6 ----- VORAGEN AGJ: "Cutting-edge carbohydrates" PREPARED FOODS, vol. 169, no. 5, May 2000 (2000-05), pages 137-138, XP009002318 the whole document ----- EP 0 914 778 A (VETOQUINOL SA ;CONS NUTRITION LC (US)) 12 May 1999 (1999-05-12) claims 1,3,7,9 ----- -/--	1,5,6, 8-11 14 1,10,11 1

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

23 September 2003

Date of mailing of the international search report

22.01.2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Groh, B

INTERNATIONAL SEARCH REPORT

Internatic lication No
PCT/NL 03/00455

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	EP 1 216 706 A (MAXIM MARKENPRODUKTE GMBH & CO) 26 June 2002 (2002-06-26) column 1, line 56 - column 2, line 4; claims 1,4,6 -----	1,2,9-11
X	WO 00/20013 A (NARUSZEWICZ MAREK; PROBI AB (SE)) 13 April 2000 (2000-04-13) claims 1,2,8 -----	1,2,10
X	FR 2 741 509 A (STANDA LAB SA) 30 May 1997 (1997-05-30)	1,3,11
A	Translated title from WPI: 'Improving intestinal tract flora-by administration of probiotic and bifid. bacteria in dehydrated form' page 6, line 1 - line 24; claims 1-3,5 -----	4
X	WO 01/005413 A (LEGRAND CHARLES GABRIEL ;ROUSSEL EDMOND DANIEL (FR); STANDA LAB SA) 25 January 2001 (2001-01-25) Translated title from WPI: 'Use of propionic bacteria in gastro-resistant form has antifungal effect in the colon and aids the absorption of essential minerals'claims 1,5,7,9,11 -----	1,5-11
X	SARKAR S ET AL: "PROCESS FOR THE MANUFACTURE OF A NEW MODIFIED CULTURED MILK PRODUCT FOR INFANTS AND CHILDREN" MILCHWISSENSCHAFT, VV GMBH VOLKSWIRTSCHAFTLICHER VERLAG. MUNCHEN, DE, vol. 53, no. 11, 1998, pages 603-605, XP000799389 ISSN: 0026-3788 page 603, column 1 - page 604, columns 1-2 -----	1,10,11
X	RINTA-KOSKI M; BEASLEY S; MONTONEN L; MANTERE-ALHONEN S: "Propionibacteria isolated from fumen used as possible probiotics together with bifidobacteria" MILCHWISSENSCHAFT, vol. 56, no. 1, January 2001 (2001-01), pages 11-13, XP009002154 page 11, paragraph 1-4 - page 13, paragraph 2 -----	1,3,6-8, 11
X	MANTERE-ALHONEN: "Propionibacteria used as probiotics - a review" LAIT, vol. 75, no. 4-5, 1995, pages 447-452, XP009002175 ISSN: 0367-2387 ----- -/--	1,3,6-8

INTERNATIONAL SEARCH REPORT

International Application No
PCT/NL 03/00455

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	YOUNG J: "European market developments in prebiotic- and probiotic- containing foodstuffs" THE BRITISH JOURNAL OF NUTRITION, vol. 80, no. 4, October 1998 (1998-10), pages S231-S233, XP009002339 ISSN: 0007-1145 page S231, paragraphs 1,2 -----	1,5
Y	MORI H ET AL: "ISOLATION AND STRUCTURAL IDENTIFICATION OF BIFIDOGENIC GROWTH STIMULATOR PRODUCED BY PROPIONIBACTERIUM FREUDENREICHII" JOURNAL OF DAIRY SCIENCE, XX, US, vol. 80, no. 9, 1997, pages 1959-1964, XP009002165 ISSN: 0022-0302 page 1959, paragraph 1 - paragraph '0003! -----	1,10,11
X	US 5 478 557 A (DELOACH JOHN R ET AL) 26 December 1995 (1995-12-26) claims 1,6,17 -----	1,6-8,10
A		4
P,X	WO 02/060276 A (MAEYRAE-MAEKINEN ANNIKA ;SUOMALAINEN TARJA (FI); VALIO LTD (FI); V) 8 August 2002 (2002-08-08) claims 1,3,6-9,11 -----	1,5,6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/NL 03/00455

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-11

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-11

Use of a substance (Propionibacterium and/or prebiotic that stimulates activity of Propionibacterium) in the manufacture of a dietary supplement for use in a method as further specified in claim 1

2. claims: 12-15

Dietary supplement comprising Propionibacterium, a prebiotic and a nutritionally acceptable carrier (as further specified in claim 12).

INTERNATIONAL SEARCH REPORT

International Application No
PCT/NL 03/00455

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6077504	A	20-06-2000	IT MI961329 A1	29-12-1997
			AT 199485 T	15-03-2001
			AU 724852 B2	05-10-2000
			AU 3047697 A	21-01-1998
			BR 9706554 A	20-07-1999
			CA 2227497 A1	08-01-1998
			DE 69704194 D1	12-04-2001
			DE 69704194 T2	21-06-2001
			DK 847244 T3	23-04-2001
			EP 0847244 A1	17-06-1998
			ES 2157074 T3	01-08-2001
			GR 3035999 T3	28-09-2001
			HU 9901619 A2	30-08-1999
			WO 9800035 A1	08-01-1998
			NO 976077 A	28-04-1998
			PL 324643 A1	08-06-1998
			PT 847244 T	29-06-2001
			US 6326000 B1	04-12-2001
EP 0914778	A	12-05-1999	EP 0914778 A1	12-05-1999
			JP 11171783 A	29-06-1999
EP 1216706	A	26-06-2002	DE 10064732 A1	11-07-2002
			EP 1216706 A2	26-06-2002
WO 0020013	A	13-04-2000	AU 764011 B2	07-08-2003
			AU 1088700 A	26-04-2000
			BR 9914184 A	19-06-2001
			CA 2345110 A1	13-04-2000
			CN 1320039 T	31-10-2001
			EP 1117414 A1	25-07-2001
			JP 2002526413 T	20-08-2002
			NO 20011491 A	23-03-2001
			PL 347029 A1	11-03-2002
			SE 9803334 A	02-04-2000
			WO 0020013 A1	13-04-2000
FR 2741509	A	30-05-1997	FR 2741510 A1	30-05-1997
			FR 2741509 A1	30-05-1997
			AU 7699696 A	19-06-1997
			BR 9611609 A	28-12-1999
			CA 2235709 A1	05-06-1997
			EP 0863763 A1	16-09-1998
			WO 9719689 A1	05-06-1997
			JP 2000502247 T	29-02-2000
			PL 326982 A1	09-11-1998
			RU 2152792 C1	20-07-2000
WO 0105413	A	25-01-2001	FR 2796554 A1	26-01-2001
			AU 765371 B2	18-09-2003
			AU 6577600 A	05-02-2001
			BR 0012681 A	16-04-2002
			CA 2379727 A1	25-01-2001
			CN 1371283 T	25-09-2002
			EP 1194154 A1	10-04-2002
			WO 0105413 A1	25-01-2001
			FR 2796555 A1	26-01-2001
			JP 2003504409 T	04-02-2003

INTERNATIONAL SEARCH REPORT

International Application No

PCT/NL 03/00455

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5478557	A	26-12-1995	US 5340577 A	23-08-1994
			AU 693146 B2	25-06-1998
			AU 1402095 A	03-07-1995
			BR 9408295 A	26-08-1997
			CA 2178192 A1	22-06-1995
			CN 1142773 A	12-02-1997
			CZ 9601733 A3	13-08-1997
			EP 0785800 A1	30-07-1997
			FI 962429 A	18-07-1996
			HU 74951 A2	28-03-1997
			JP 9506625 T	30-06-1997
			NZ 278508 A	25-03-1998
			PL 314986 A1	30-09-1996
			SK 76596 A3	04-06-1997
			WO 9516461 A1	22-06-1995
			AU 3736593 A	03-03-1994
			WO 9403195 A1	17-02-1994
			US 5604127 A	18-02-1997
WO 02060276	A	08-08-2002	FI 20010157 A	26-07-2002
			CA 2434337 A1	08-08-2002
			EE 200300351 A	15-12-2003
			EP 1359816 A1	12-11-2003
			WO 02060276 A1	08-08-2002
			NO 20033283 A	24-09-2003