



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁶ : A23K 1/00</p>	<p>A1</p>	<p>(11) International Publication Number: WO 95/11597</p> <p>(43) International Publication Date: 4 May 1995 (04.05.95)</p>
<p>(21) International Application Number: PCT/FI93/00443</p> <p>(22) International Filing Date: 28 October 1993 (28.10.93)</p> <p>(71)(72) Applicants and Inventors: SETÄLÄ, Jouko [FI/FI]; Valio Ltd., P.O. Box 390, FIN-00101 Helsinki (FI). TIRKKONEN, Tapani [FI/FI]; FIN-73620 Kortteinen (FI).</p> <p>(74) Agent: PAPULA REIN LAHTELA OY; P.O. Box 981, Salomonkatu 17 B, FIN-00101 Helsinki (FI).</p>	<p>(81) Designated States: FI, NO, SE, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).</p> <p>Published <i>With international search report.</i> <i>In English translation (filed in Finnish).</i></p>	
<p>(54) Title: METHOD FOR THE DISPENSATION OF A FEEDSTUFF, AND A FEEDSTUFF</p>		
<p>(57) Abstract</p> <p>The invention concerns a procedure for dispensing to small animals feed presented in coarse granular form, said feed containing possibly albumin, carbohydrate, fat and/or mineral/vitamin components; in said procedure for the animals' bedding material being used changeable litter material. In the procedure, feed is dispensed to the animals admixed to the litter material. The invention furthermore concerns a small animal feed composition meant to be administered to the animals, admixed to the litter material.</p>		

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	GB	United Kingdom	MR	Mauritania
AU	Australia	GE	Georgia	MW	Malawi
BB	Barbados	GN	Guinea	NE	Niger
BE	Belgium	GR	Greece	NL	Netherlands
BF	Burkina Faso	HU	Hungary	NO	Norway
BG	Bulgaria	IE	Ireland	NZ	New Zealand
BJ	Benin	IT	Italy	PL	Poland
BR	Brazil	JP	Japan	PT	Portugal
BY	Belarus	KE	Kenya	RO	Romania
CA	Canada	KG	Kyrgyzstan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo	KR	Republic of Korea	SE	Sweden
CH	Switzerland	KZ	Kazakhstan	SI	Slovenia
CI	Côte d'Ivoire	LI	Liechtenstein	SK	Slovakia
CM	Cameroon	LV	Latvia	SN	Senegal
CN	China	LU	Luxembourg	TD	Chad
CS	Czechoslovakia	MC	Monaco	TG	Togo
CZ	Czech Republic	MD	Republic of Moldova	TJ	Tajikistan
DE	Germany	MG	Madagascar	TT	Trinidad and Tobago
DK	Denmark	ML	Mali	UA	Ukraine
ES	Spain	MN	Mongolia	US	United States of America
FI	Finland			UZ	Uzbekistan
FR	France			VN	Viet Nam
GA	Gabon				

METHOD FOR THE DISPENSATION OF A FEEDSTUFF, AND A FEEDSTUFF.

The present invention concerns a procedure for dispensing small animal feed to an animal, and a small animal feed used in said procedure.

In the present context, small animals are particularly understood to be rodents, rabbits and equivalent, comparatively small-sized animals which are kept in a confined space, e.g. in a cage, as pets or as experimental animals.

Particularly in feeding experimental animals the practice has been to use e.g. commercial feeds which come in granular form and contain albumin, carbohydrate, fat and/or mineral/vitamin components. Examples of animal feeds are presented in references DE 3 604 308 and DE 2 521 217. Furthermore, in connection with rearing and managing experimental animals, feeding the animals is a specific work step, which is carried out as one of the steps in conjunction with other detail tasks of the care. As a rule, small animal feed is placed in a separate container, made of metal wire or equivalent, in the upper part of the cage, from which the animals ingest feed in accordance with need. Such dispensing in a small container is fairly cumbersome and time-consuming.

In the interest of the animals' hygiene and better thriving, litter material is spread on the base of the rearing space, e.g. the cage, to constitute bedding material. This litter material is frequently changed. Litter material is in the present context understood to be any kind of usable material which is able to bind moisture. As examples of litter materials may be mentioned lignocellulose-based fibrous material, such as wood substance, dry parts of grass plants, and paper. Examples of litter materials known in the state of art have been presented in references FI 87 719 and US 5 044 324.

The object of the present invention is to disclose a novel dispensing procedure thanks to which the animal is positively activated and by which the basic care operations can be simplified and speeded up. The
5 object of the invention is, furthermore, to disclose a novel kind of feed meant for small animals. As regards the features characterizing the invention, reference is made to the claims.

In studies associated with the invention, an
10 unexpected observation was made when litters and feed were intentionally mixed together. In the first place, such mixing together has been found to have a remarkably significant effect on the animals' thriving and on their activity. Administration of feed to the animals
15 admixed with the litter material caused the animals to become activated and to start gathering and separating feed particles from among the litter material, leaving soiled feed particles untouched. The animals have thus begun to gather and arrange their food themselves. This
20 activity has been found to lessen the stress which quite commonly occurs in animals locked up in a cage, e.g. owing to inactivity.

Heretofore, feed may have ended up among the litter material e.g. as a result of inadvertent over-
25 turning of the feed container. Such admixture has commonly been considered undesirable, and therefore the feed container has usually been fixedly mounted in the upper part of the cage, in order to avoid admixture.

Now, in connection with the present invention,
30 is the first time that a dispensing procedure meant for small animals is presented in which small animal feed is deliberately admixed to the base material, that is to the litter material. The feed and the litter material may be separately dispensed onto the base, such as
35 the cage bottom, in which case the feed is dispensed prior to spreading litter material or, to particular advantage, after spreading the litter material, upon

this material and so as to become admixed thereto. The feed may thus be dispensed e.g. in connection with litter changing, or later in an independent operation. Alternatively, the feed may first be mixed with the
5 litter material and the mix thus obtained, dispensed on the base. It is possible, of course, to add feed material, as needed, into the ready-made feed/litter mix on the base.

Small animal feed may be dispensed in quantities commonly used or, when feed material is used for
10 litter, in quantities exceeding usual practice. Advantageously, small animal feed is dispensed about 5 to 60% of the aggregate volume of feed and litter material. If desired, the quantity of litter material used
15 may be smaller than in present practice. When dispensed as taught by the invention, the feed may serve both as nutrition and as base litter.

The procedure of the invention can be implemented using any kind of coarse-granular small animal
20 feed. To particular advantage the procedure is implemented using small animal feed consisting of particles in the external shape of which the dispensing according to the invention, among the litter material, has been taken into account.

25 Therefore, the invention furthermore introduces a small animal feed which is in coarse-granular form and contains, possibly, albumin, carbohydrate, fat and/or mineral/vitamin components. As taught by the invention, the feed contains at least one colouring
30 agent to colour the feed to have a colour substantially consistent with that of the litter material, and the feed is intended to be given to the animals, admixed to litter material.

In the context of this invention, a colouring
35 agent is understood, in a broad sense, to mean any substance imparting colour, which may be a colouring substance or dye commonly used in connection with

feedstuffs or foodstuffs which is appropriate for eliciting a colour corresponding to that of the litter material, or another substance, e.g. one possessing nutritive value, which is not commonly used as a colouring agent proper but which can impose the desired colour on the feed.

According to a particularly advantageous embodiment, the feed contains, as colouring agent, whey, milk powder and/or raw material derived by processing from these, about 10 to 100%. Since these colour-imparting substances possess nutritive value in themselves, the feed may, if desired, consist exclusively of one or several such substances. The colour produced by these substances may vary from white to deep yellow, depending on the substance used and on the quantities used.

The feed litter used in conjunction with feed according to the invention is advantageously composed of wood substance, which may be in the form e.g. of chips, choppings and/or (saw)dust. In that case the feed of the invention will advantageously contain whey, milk powder and/or raw material derived from these by processing.

Feed according to the invention is not distinguished among the litter material by its colour, whereby the base material has a coherent appearance and the general impression of the animals' premises is congenial. The animals distinguish the feed by smell.

In an advantageous embodiment, the external shape of the feed particles is consistent with that of the litter material particles, in which case e.g. when the above-mentioned wood particles, such as chips, are being used, the particles of the feed of the invention containing whey or another equivalent product, are moreover substantially shaped like the litter particles, such as chip-like granules for instance.

The feed of the invention may in addition to

colouring agent(s) contain other components known in the context of small animal feeds, these being selected in accordance with the animal species to be fed, according to common practice, and in quantities conforming to the animal's requirements. If the colouring substance constitutes part of the nutrient components, as is the case with whey and with milk powder, the nutritive value of the substance may be taken into account in selecting other raw material components.

Among the other remarkable advantages afforded by the invention there may be mentioned that feed dispensing carried out in connection with other care operations will be simplified; feed as well as litter material are spread e.g. on the bottom of the animal's cage in a layer of appropriate thickness. After a suitable time, e.g. after 1 to 3 days, the feed/litter material layer is removed from the cage bottom and replaced with a new layer of the mix. It is a further advantage that no special storage containers are needed for feed. Consequently, the design of the animals' rearing spaces, such as a cage, may also be simplified.

When feed according to the invention and litter material are used mixed together, as a ready-to-use mix which is dispensed to the animals as it is, the feed and the litter material may, if desired, be packaged in one single package. In that case no separate storage facilities are needed for litter and for feed.

Above all, the animals' conditions of living will improve because the animals are provided with a sensible occupation.

On the other hand, the litter material presently employed and feed are substantially equally priced, and therefore the use of feed according to the invention does not involve higher cost than feeds known in the art, even if part of the feed should get lost. Since owing to the arrangement taught by the invention litter need not be used in quantities such as are pres-

ently applied, part of the litter being replaceable with feed if desired, the consumption of litter can even be reduced. In big experimental animal laboratories, the diminished need of using litter is an economic advantage, and it reduces the quantities of waste and therefore, the costs incurred in waste disposal.

The invention is described in the following, with the aid of embodiment examples.

10 Example 1: Whey-based feed

A feed mix meant for rodents is prepared in which whey, low-lactose whey and milk powder are used for colouring agent.

15	Constituents	% by weight
	Low lactose whey powder	35
	Whey powder	10
	Milk powder	20
20	Raw material derived from cereal	25
	Vegetable albumin	6
	Oils, fats	2
	Minerals/vitamins	2

25 The ingredients are mixed and the mixture thus obtained is pressed under high pressure, resulting in a granular mix. Granulation may be performed in a manner producing flattened or chip-like granules and/or roundish granules. The particle size of the mix may vary within 0 to 30 10 mm. The feed mix is suitable for use e.g. together with litter material consisting of light-coloured wood particles.

Example 2: Feed coloured with a proper colouring agent

35 A feed mix meant for rodents is prepared in which for colouring agent is used a substance commonly employed to colour feed, in a quantity matching the

colour of the litter material used.

	Constituents	% by weight
5	Raw material derived from cereal	60
	Vegetable albumin	25
	Fish meal	10
	Oils, fats	3
	Minerals/vitamins	2
10	Colouring agent	

The ingredients are mixed and the mixture thus obtained is pressed under high pressure, resulting in a granular mix.

15 Tests performed with animals have shown that the mode of dispensing feed according to the invention activates the animals and improves their thriving.

The hygienic aspect of the mode of dispensing was also studied by taking samples from the feed/litter material substrates on the cage bottoms, for microbiological assays. On the strength of the study, the feed/litter material can be kept a few days as bedding for the animals without incurring any health risk. The animals' own, surprisingly active tidying contributes to keeping the food clean.

25 The requirements imposed on the litter material, e.g. in material containing wood chips, regarding cleanliness are similar to those which apply to the feed. Therefore admixture of feed to such material has not been found to cause any health risk whatsoever to the animals.

The following may be presented as examples of the dispensing method of the invention. In a cage inhabited by one mouse or rat a feed mix dose can be placed which comprises, as base litter, wood chips or small pieces of wood comprising finely divided wood substance: 9 decilitres, and feed pellets proper, 4

decilitres. The total quantity will thus be 13 dl.

In the foregoing the invention has been described by reference to advantageous embodiment examples thereof, but it is obvious that the invention can
5 be modified in many different ways within the scope of the inventive idea defined by the claims following below.

CLAIMS

1. A procedure for dispensing to small animals feed presented in coarse granular form, said feed
5 containing possibly albumin, carbohydrate, fat and/or mineral/vitamin components; in said procedure for the animals' bedding material being used changeable litter material, characterized in that feed is dispensed to the animals admixed to the litter material.
- 10 2. Procedure according to claim 1, characterized in that the feed is dispensed on the base before the litter material.
3. Procedure according to claim 1, characterized in that the feed is dispensed upon the litter
15 material base.
4. Procedure according to claim 1, characterized in that feed is first admixed to the litter material and mix thus obtained is dispensed onto the base.
- 20 5. Procedure according to any one of claims 1-4, characterized in that feed is dispensed about 5 to 60% of the aggregate volume of feed and litter material.
6. Procedure according to any one of claims
25 1-5, characterized in that the feed contains at least one colouring agent for colouring the feed to have a colour substantially consistent with that of the litter material used.
7. Procedure according to any one of claims
30 1-6, characterized in that in the procedure such feed is used which contains about 10 to 100% by weight colouring substance producing light colour, this substance being selected from the group comprising whey, milk powder and/or raw material derived from these by processing.
- 35 8. Procedure according to any one of claims 1-7, characterized in that in the procedure litter ma-

terial is used which consists of wood particles presented in the form of chips, choppings and/or dust.

9. Procedure according to any one of claims 1-8, characterized in that in the procedure such feed
5 is used of which the particles have an external shape consistent with that of the particles of the litter material used.

10. Procedure according to any one of claims 1-9, characterized in that in the procedure litter ma-
10 terial is used which consists of light-coloured wood chips, and such feed which contains whey, in the form of chip-like granules.

11. Coarse granular small animal feed containing possibly albumin, carbohydrate, fat and/or
15 mineral/vitamin components and which is intended for animals for whose bedding material is used changeable litter material, characterized in that said feed contains at least one colouring agent for colouring the
20 feed to have a colour substantially consistent with that of the litter material used, and the feed is meant to be dispensed to the animals, admixed with the litter material.

12. Procedure according to claim 11, characterized in that the feed contains about 10 to 100% by
25 weight of a colouring agent producing light colour and which is selected from the group comprising whey, milk powder and/or raw material derived from these by processing.

13. Procedure according to claim 11 or 12,
30 characterized in that the litter material is composed of wood particles which are presented in the form of chips, choppings and/or dust.

14. Procedure according to any one of claims 11-13, characterized in that the external shape of the
35 particles of the feed is consistent with that of the litter material particles.

15. Procedure according to any one of claims

11-14, characterized in that the litter material which is used consists of light-coloured wood chips, and the feed contains whey and is presented in the form of chip-like granules.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 93/00443

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: A23K 1/00

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)

IPC6: A23K, A01K

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

SE,DK,FI,NO classes as above

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

WPI, CA, CLAIMS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Dialog Information Services, File 350, World Patent Index 63-80, Dialog accession no. 000783452, WPI accession no. 71-25104S/15, RAMBUSCH H. et al, "Cattle feed cake contng poultry deep - litter". DD 78479, A, 000000, 7115 (Basic)	1-15

A	EP, A2, 0285098 (SUOMEN SOKERI OY), 5 October 1988 (05.10.88)	1-15

 Further documents are listed in the continuation of Box C. See patent family 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

15 June 1994

Date of mailing of the international search report

17 -06- 1994

Name and mailing address of the ISA/
Swedish Patent Office
Box 5055, S-102 42 STOCKHOLM
Facsimile No. +46 8 666 02 86

Authorized officer

Dagmar Järvman
Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT
Information on patent family members

28/05/94

International application No.
PCT/FI 93/00443

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A2- 0285098	05/10/88	US-A- 4954355	04/09/90