METHOD FOR STUNNING ANIMALS, IN PARTICULAR POULTRY

FIG. 2

A method for stunning animals, in particular poultry, comprising the steps of: - providing a chamber at controlled atmosphere containing CO2, light, ultrasound, microwaves or a combination thereof; - subjecting the animal to the gases of said chamber until it reaches a state of semiconsciousness (3) or incapacity to react; - providing a generator of electrical discharges; and - subjecting the head of the animal to an electrical discharge such that it assumes a state of complete unconsciousness (5).
"Method for stunning animals, in particular poultry"

Field of the invention

The present invention relates to a method for stunning animals, in particular poultry.

In general, the purpose of stunning an animal is to prevent it from suffering during slaughter.

A slaughtering process comprises a first step of jugulation, which consists in the cutting the jugular veins and/or the carotid artery, and a second step of bleeding in order to guarantee maximum conservability of the carcass. The aim is to stun the animal for the time necessary for carrying out jugulation and bring about death of the animal by bleeding. Death must then occur before the animal has been able to come round on account of the effects of stunning wearing off.

State of the art

Among systems of stunning that are known and used with poultry there is the so-called system of "gas stunning ", which envisages conveying the poultry, on belts or in boxes, through a space at controlled atmosphere containing mixtures of CO₂, argon, nitrogen, or else CO₂ in air, and in some cases very poor in oxygen (comprising at the most 2% of the total volume), which when inhaled induces a state of complete unconsciousness and immobility in the animal. At times, said mixtures can likewise cause cessation of the cardiorespiratory activity of the animal and hence its death. This circumstance is, however, undesired in so far as blocking of the blood flow in the animal prevents complete bleeding, thus creating problems for the treatment and conservation of the meat. Furthermore, these mixtures prove very costly, this being the reason why the diffusion of said type of systems is still limited.

A much more widespread system of stunning is instead that of electronarcosis, which consists in applying electrical current to the animal causing loss of all sensitivity, loss of consciousness, and loss of reflexes. Even though its practice is very widespread, said system presents, however, various drawbacks. In the first place, the stunning that is caused has a duration limited to a few minutes (generally from 1 to 3 minutes), after which the animal can come round; in the cases where this occurs, in addition obviously to the death that is extremely painful for the animal, serious discomfort is caused to the operator who
must keep the animal under control, since, following upon its coming-round, it is
usually in a state of confusion and in some cases of madness. In the second place,
the electric shock of electronarcosis may cause a general contraction of the
muscles of the animal, so that the meat obtained can prove in general tough and
with a high bacterial charge, being soaked with blood as a result of the muscular
contractions.

Summary of the invention

The present invention has the purpose of providing a method for stunning
that does not present the drawbacks illustrated above of the known art.

Said purpose is achieved via a method presenting the characteristics
specified in Claim 1.

The subject of the present invention is, moreover, a slaughtering method
presenting the characteristics specified in Claim 4.

Description of the drawings

The invention will now be described in detail with reference to the annexed
drawings, which are provided purely by way of non-limiting example and in
which:

- Figure 1 represents a block diagram of the method described herein;
- Figure 2 represents a preferred possible, but not the only, embodiment of a

killing device for implementing said method.

Description of the invention

Described in what follows is a slaughtering method with specific reference
to an application on chickens. However, it is to be noted that said method can be
effectively used on any type of animal, in particular on any kind of poultry.

Figure 1 illustrates a block diagram of the method described herein.

Steps 1 and 2 illustrate respectively conveyance of the poultry alive and
housing thereof in cages. These steps can be performed in any conventional way,
taking, however, into account the fact that they must be performed as gently as
possible, preventing any panic or stress in the animals.

The method described herein then envisages implementation, already
starting from this stage, of a procedure of stunning of the animal. In particular,
said procedure comprises the steps 3 and 5 that will be described in what follows.

Step 3 consists in stunning the animal so that it will reach a state of
semiconsciousness (or partial unconsciousness) and/or of immobilization, in
which it is incapable of reacting. Said step is in particular performed via a
chamber at controlled atmosphere containing $CO_2$, through which the animal is
made to pass, for example carried by automated means of conveyance. Preferably, said chamber is filled with a mixture containing $CO_2$ at low concentrations, variable from 5 vol% to 20 vol%, and air, in which the percentages of oxygen are not lower than 15 vol%.

In step 4 the chickens are then hung on overhead conveyors for being sent on into the slaughter room proper. The state of semiconsciousness reached by the animal after it has been subjected to the treatment of step 3 enables the operators to handle the chickens without the risk of these being able to react or struggle. Thanks to step 3 the animal is thus saved any harm to its wings or pectoral muscles, which in conventional methods is caused by the fact that the bird struggles, given that at this stage it is still fully conscious and active. Furthermore, said step 3, on account of the vasodilator effect caused by $CO_2$, enables complete relaxing of the muscles of the animal to be obtained.

Step 5 then envisages a definitive stunning of the animal with electric current. For this purpose, a killing device is provided that is designed to generate an electric shock only in the area of the head, without it traversing the entire body. In particular, the killing device is able to operate in a completely automatic manner. Said targeted electrocution is possible thanks to the fact that the chickens are already in a state of semiconsciousness and substantially immobile, thus allowing the killing device to intervene in a precise way thereon. Thanks to said targeted electrocution, which prevents precisely onset of electrical shocks throughout the body of the animal, it is possible to maintain the state of relaxation of the muscles obtained in step 3.

Preferably, step 5 of definitive stunning of the animal is performed one second before step 6, which is also performed by the killing device and in which the animal undergoes jugulation. Steps 7 and 8 finally consist in bleeding and plucking of the bird.

The death of the animal occurs in the bleeding step, by acute anaemia, to the benefit of the final quality of the meat.

It should be noted that in the case of premature death, for causes not correlated to the process, the dead chickens are in any case readily recognizable from the others and can thus be rejected. In fact, since, according to the stunning method described herein, the animal is preliminarily stunned only partially, it enables the operator, for example when he hangs the animal on the overhead
conveyor during step 4, to distinguish the live but substantially inert chickens from the ones whose cardiorespiratory activity has instead ceased. In this connection, it is to be noted that in conventional stunning methods, above all in gas stunning methods, the dead chickens are not instead distinguishable from the live unconscious ones so that also they end up undergoing the slaughtering process to the detriment of the quality of the meat produced.

As emerges from the foregoing, the stunning method described above thus ensures a painless slaughter for the animal, enabling at the same time a high-quality meat to be obtained that can be preserved in optimal conditions.

The present applicant has finally noted that the adoption of the stunning method described above enables excellent-quality plucking of the poultry.

Illustrated in Figure 2 is a possible but non-limiting embodiment of the killing device referred to above. In general, the killing device 10 of Figure 2 comprises, in succession, an inlet section 11, an electrified section 12, an accompanying section 13, and a cutting section 14.

Specifically, the killing device 10 comprises a tubular structure made of metal material having vertical portions 21, which support a pair of elongated elements 22 that extend substantially in the direction of advance of the overhead conveyor and have the function of engaging and guiding the neck of the animal. In a position corresponding to an end thereof (the left-hand end as viewed in Figure 2), the elements 22 are directed outwards so as to define a V-shaped portion for entry of the neck of the animal and are moreover provided with plates 23, facing the outside and upwards, which are designed to convey the neck of the animal between the two elements 22. Said V-shaped portion defines the inlet section 11 of the killing device.

The electrified section 12 is provided in a position corresponding to a portion of the elements 22 immediately subsequent to the V-shaped portion and is performed by connecting said portion to an electric power source 24. Said portion is preferably electrically insulated from the remaining parts of the elements 22. Alternatively, it is also possible to charge the entire elements 22 electrically. Downstream of the electrified section are the accompanying section 13 and the cutting section 14. The cutting section has a circular blade 25 carried by a shaft 26, which can turn about a substantially horizontal axis governed by an electric motor (not illustrated).

As may be seen in Figure 2, the elements 22 have a longitudinal
development of a double-helix type such that they are substantially set alongside one another at the inlet section of the device, and then come, instead, to assume a position where they are substantially set on top of one another at the cutting section. As a result of the double-helix development of the elements 22 by which it is engaged, the neck of the animal, in a position corresponding to the accompanying section, is made to turn in such a way as to pass from a substantially vertical orientation to a substantially horizontal orientation at entry to the cutting section. In this way, when it reaches the cutting section, the neck of the animal is oriented in the optimal way for being cut by the blade 25.

The killing device illustrated in Figure 2 has a substantially linear development. It is in any case possible to envisage also killing devices having a circular development, comprising, in a way similar to what has just been described, an inlet section, an electrified section, an accompanying section, and a cutting section.
CLAIMS

1. A method for relaxing and stunning animals, in particular poultry, comprising the steps of:
   - providing a chamber at controlled atmosphere containing CO₂ or any other system such as light, ultrasound, microwaves or a combination thereof;
   - subjecting the animal to an atmosphere of said chamber until it reaches a state of semiconsciousness (3);
   - providing a generator of electrical discharges; and
   - subjecting only the head of the animal to at least one electrical discharge so that it assumes a state of complete unconsciousness (5).

2. The method according to Claim 1, characterized in that said chamber contains a mixture of CO₂ at low concentrations, variable from 5% to 20%, and air, in which the percentages of oxygen are not lower than 15%.

3. The method according to Claim 1, characterized in that the animal is conveyed through said chamber via automated means.

4. The method according to Claim 1, characterized in that is applied on poultry.

5. A method for slaughtering animals, in particular poultry, comprising the steps of:
   - providing a chamber at controlled atmosphere containing CO₂, light, ultrasound, microwaves, or a combination thereof;
   - subjecting the animal to the atmosphere of said chamber until it reaches a state of semiconsciousness (3);
   - hanging the animal on an overhead conveyor (4);
   - providing a generator of electrical discharges;
   - subjecting only the head of the animal to at least one electrical discharge of said generator so that it assumes a state of complete unconsciousness (5); and
   - carrying out jugulation of the animal (6).

6. The method according to Claim 5, characterized in that the animal is subjected to the electrical discharge one second before jugulation when it is already in a state of semiconsciousness or in any case of incapacity to react.

7. The method according to Claim 5, characterized in that said chamber contains a mixture of CO₂ at low concentrations, variable from 5% to 20%, and air, in which the percentages of oxygen are not lower than 15%.

8. The method according to Claim 6, characterized in that one and
the same killing device is designed to generate the electrical discharge in the head of the animal and for carrying out jugulation.

9. The method according to Claim 5, characterized in that it is applied on poultry.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

INV. A22B3/08 A22B3/06

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)

A22B

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
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<td>Y</td>
<td>NL 1 018 486 C2 (STORK PHT [NL]) 16 January 2003 (2003-01-16) * abstract; claims 1-44; figures 1-7 page 1, line 5 - page 21, line 6</td>
<td>1-9</td>
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<td>Y</td>
<td>US 2 879 539 A (CERVIN CURT M) 31 March 1959 (1959-03-31) col umn 1, line 15 - col umn 6, line 34; claims 1-9; figures 1-5</td>
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<td>A</td>
<td>US 6 056 637 A (FREELAND JAMES P [US] ET AL) 2 May 2000 (2000-05-02) * abstract; claims 1-10; figures 1-6 col umn 1, line 6 - col umn 7, line 60</td>
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Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:
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<td>WO 2009/047531 A1 (MATEFORX AS [NO]; HAVFORSKNINGSINSTITUTTET [NO]; COCKBAIN JULIAN [GB];) 16 April 2009 (2009-04-16) * abstract; claims 1-12; figures 1-2 pages 1-5</td>
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