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Method and device for preparing fodder mixtures for livestock

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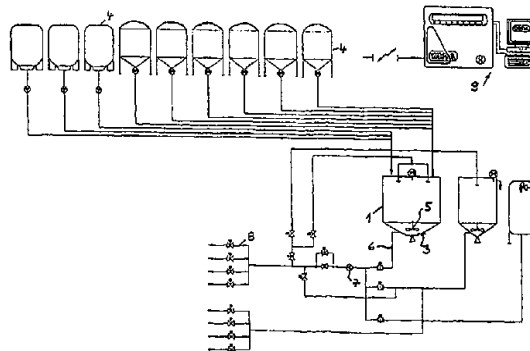


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(54) Title: METHOD AND DEVICE FOR PREPARING FODDER MIXTURES FOR LIVESTOCK

(52) Bezeichnung: VERFAHREN UND EINRICHTUNG ZUM ZUBEREITEN VON VIEHFUTTERMISCHUNGEN



(57) Abstract

The invention relates to a method for preparing fodder mixtures for livestock, especially liquid pumpable fodder mixtures, according to which fodder components are introduced sequentially in a weighing and mixing vessel (1) where they are mixed. The pH value of said mixture is measured before or at the end of the fodder mixing process. If a given value is exceeded, acid is added as a last ingredient to the fodder mixture during a continued mixing process until pH reaches said given value. For that purpose, a pH measuring probe is placed through the vessel wall, in the bottom region of said vessel.

Abstract of the Disclosure

For preparing cattle feed mixtures, especially pumpable liquid feed mixtures, the feed components are added consecutively to a weighing and mixing container and mixed. Before or while the feed mixture is being prepared, the pH of the mixture is measured and, if it exceeds a specified value during a continued mixing process, acid is added as the last additive to the feed mixture until the specified value is reached. For this purpose, a pH measuring probe, which is passed through the wall of the container, is provided in the lower region of the weighing and mixing container.



METHOD AND DEVICE FOR PREPARING CATTLE FEED MIXTURES

The invention relates to a method for preparing cattle feed mixtures as defined in the introductory portion of claim 1 and to a device for implementing the method as defined in the introductory portion of claim 10.

For reasons of feed hygiene, it is desirable that an cattle feed, particularly a liquid feed, has a pH, which is between 4 and 5 and preferably at about 4.5. The invention is concerned with the problem of influencing the pH of the feed mixtures, especially of correspondingly large batches in weighing and mixing containers of feed stations of feeding devices. The invention solves the problem with a method of claim 1 and with a device of claim 10. With respect to further refinements, reference is made to claims 2 to 5 as well as 10 to 12.

The inventive method ensures that, during the preparation of the feed mixture the pH of this feed mixture is determined and, if it is too high, lowered in a specified manner by a gradual addition of acid. Since the addition of acid takes place at the conclusion of the actual preparation process of a batch, it is ensured that there are no further pH changes after the pH is adjusted due to the addition of further feed components. For carrying out the method, the invention furthermore provides a weighing and mixing container, which is provided in the lower region with a pH measuring probe, which is passed through the wall of the container. The sensor of such a



measuring probe accordingly lies in a region of particularly intensive feed flow, similar to that which builds up in the course of the mixing process under the action of the conventional stirrer in the weighing and mixing container. Accordingly, it is ensured that pH changes, which occur, are determined rapidly, so that the desired final value in the feed batch can be obtained precisely.

In the drawing, a feeding device is illustrated diagrammatically in Figure 1. Figure 2 shows a cutout from the container wall in the region of the pH measuring device.

The feeding device comprises a weighing and mixing container 1, in the lower portion of which there is a pH measuring probe 3, which is passed through the wall 2 of the container. The measuring probe 3 passes through a sleeve 2', which is welded into the container wall 2 and into which the probe is sealed and fixed. The weighing and mixing container 1 can be charged with feed components from silo 4 and comprises a motor-driven stirrer 5, which has mixing tools revolving centrally also in the lower region of the container. A conveying pipeline 6 discharges from the bottom region of the weighing and mixing container 1. With the help of a feed pump 7, feed can be transported through the conveying pipeline 6 into consumer pipelines 8. A central computer 9 controls the whole of the feeding device by means of a program, which may include a pH program part.

For the preparation of a feed batch, liquid and solid components of the feed are conveyed consecutively into the weighing and mixing container 1, where the amount of feed, increasing corresponding to the amount supplied, is constantly mixed. The pH is measured continuously or



at regular intervals already during this buildup of the feed charge, so that, when the charge is finished, a decision can be made by comparing the actual with the nominal value whether or not the addition of acid for adjusting the pH to the desired value is necessary. This is handled either by a computer program, which controls all details of the feed preparation process and comprises a pH program part, or by the measuring probe 3, which can be constructed as a measuring instruments and, at the same time, as a control pulse generator, which controls the addition of acid until a specified preferably adjustable nominal value is reached. If acidification of the feed is required, a nutritionally compatible acid, such as propionic acid, acetic acid or the like is added as the last component to the feed mixture either continuously in a small amount, the mixing process being continued continuously in the weighing and mixing container 1, or a small partial amount is added at intervals. During the addition of acid, the pH is measured either at consecutive intervals or continuously, so that the continuous or intermittent addition of acid can be switched off in good time and the feed batch has the desired pH at the end of the mixing. This pH preferably is 4.5. After that, the delivery of feed from the weighing and mixing container 1 can be commenced.



Claims

1. A method for preparing cattle feed mixtures, especially pumpable liquid feed mixtures, for which the feed components are added consecutively to a weighing and mixing container and mixed, wherein the pH of the feed mixture is measured before it is or while it is being prepared and, if it exceeds a specified value during a continued mixing process, acid is added as the last additive to the feed mixture until the specified value is reached.

2. The method of claim 1, wherein the pH in the feed mixture is adjusted to a value of about 4.5.

3. The method of claims 1 or 2, wherein in a nutritional compatible acid such as propionic acid is added.

4. The method of one of the claims 1 to 3, wherein the pH in the weighing and mixing container is measured continuously or at regular intervals during the whole preparation process of a feed batch and, after the feed mixture is prepared, the pH is measured continuously during the addition of acid.

5. The method of one of the claims 1 to 4, wherein the acid is added continuously in small amounts.



6. The method of one of the claims 1 to 4, wherein the acid is added intermittently in small partial amounts and the pH is measured at some time after the partial addition and a further partial addition is made or the preparation process is terminated.

7. The method of one of the claims 1 to 6, wherein the course of the method is controlled by a central computer from the start to the finish of the feed preparation.

8. The method of claim 7, wherein the actual value of the pH is compared with a nominal value by the central computer on the basis of a pH control program.

9. The method of one of the claims 1 to 7, wherein the pH sensor compares the actual with the nominal value and controls the addition of acid directly.

10. A device for carrying out the method of claim 1 with a weighing and mixing container, wherein a pH measuring probe (3), which is passed through the wall (2) of the container, is provided in the lower region of the container (1).

11. The device of claim 10, wherein the measuring probe is constructed strictly as a measuring probe.

12. The device of claim 10, when the measuring probe is constructed as a measuring instrument and as a control pulse generator.



FIG. 1

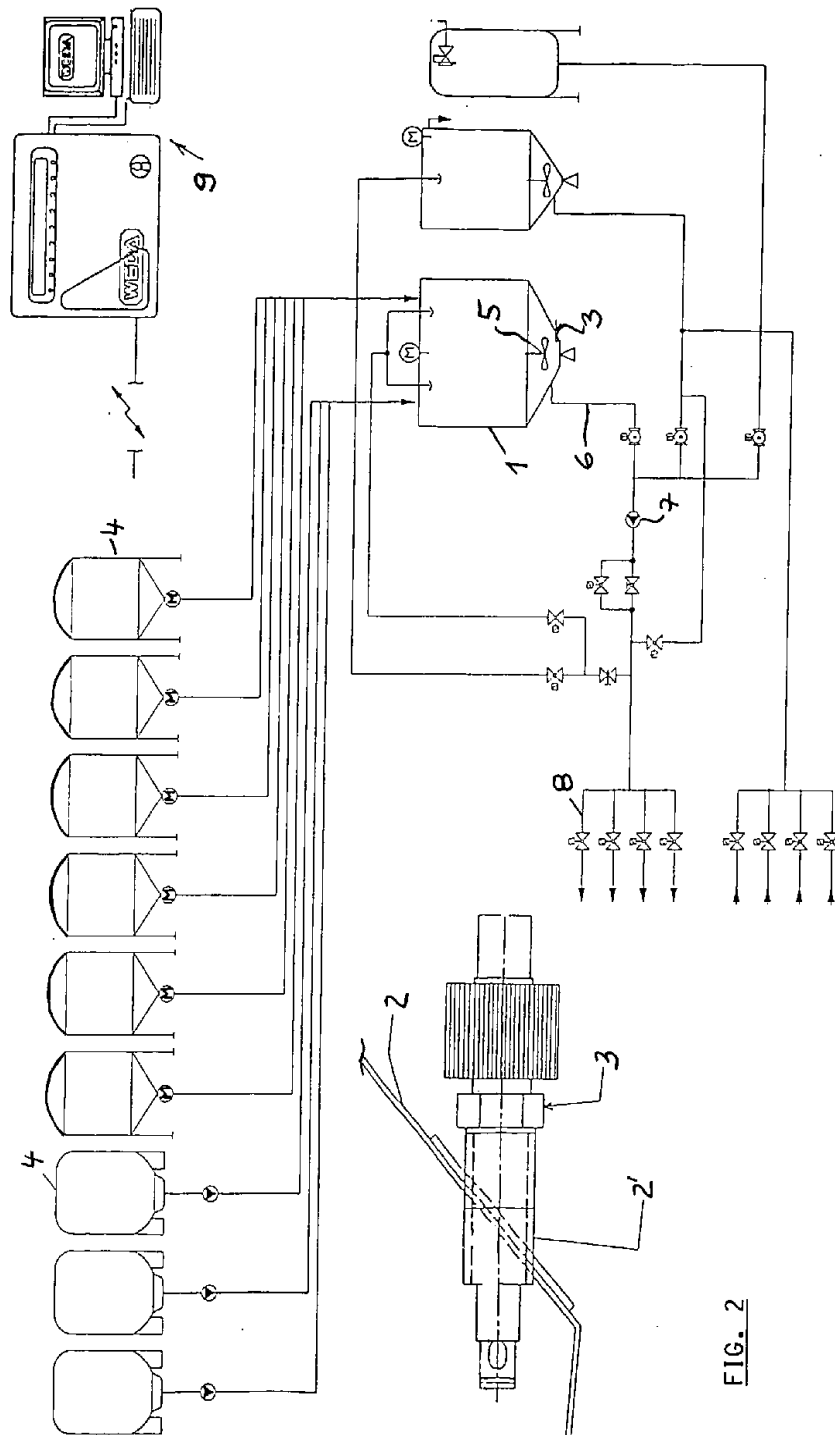


FIG. 2