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KINDVALL et al.(10) **Pub. No.: US 2016/0150816 A1**(43) **Pub. Date: Jun. 2, 2016**(54) **A SMOKELESS TOBACCO COMPOSITION
AND A METHOD FOR ITS MANUFACTURE**(71) Applicant: **SWEDISH MATCH NORTH
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EUROPE AB**, Stockholm (SE)(21) Appl. No.: **14/900,070**(22) PCT Filed: **Jun. 19, 2014**(86) PCT No.: **PCT/EP2014/062954**

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(2013.01); **A24F 23/02** (2013.01)(57) **ABSTRACT**

A smokeless tobacco or non-tobacco snuff composition for oral use comprising at least 20 wt % water based on the total weight of the final composition and at least 1 wt % lactic acid or a salt thereof based on the dry weight of the final smokeless tobacco or non-tobacco snuff composition, as well as a method for its manufacture and the use of such composition.

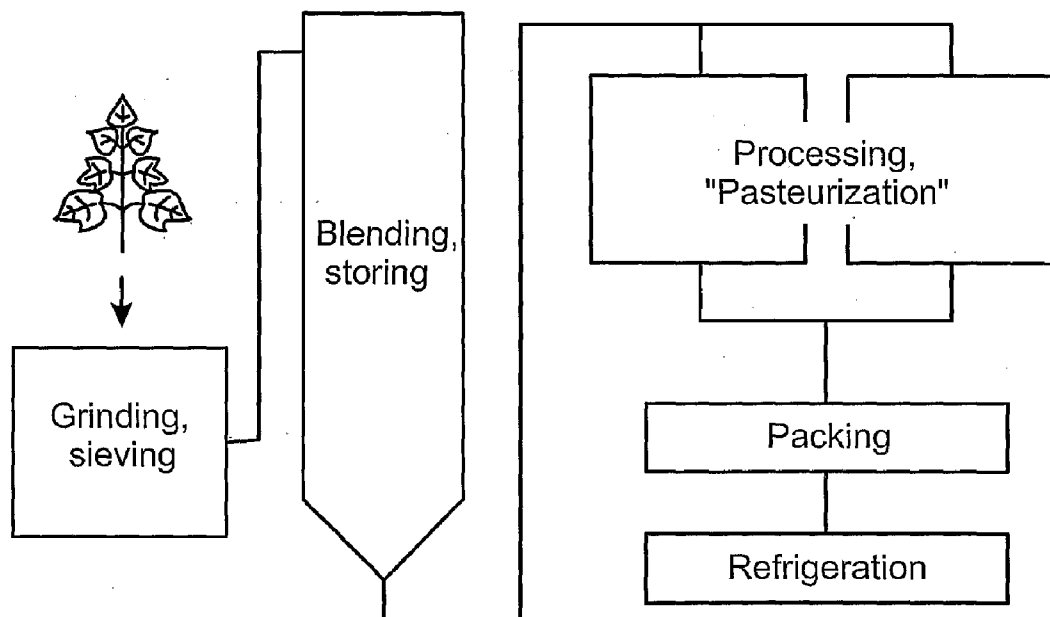


Figure 1

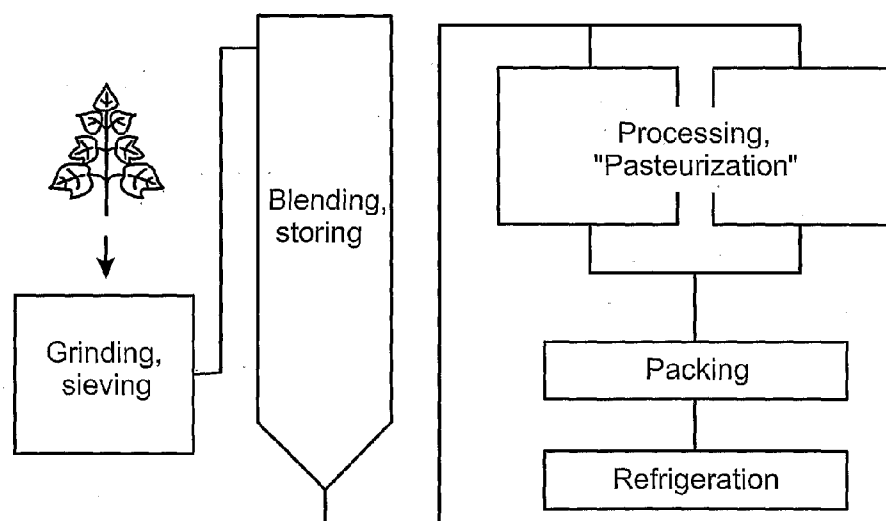
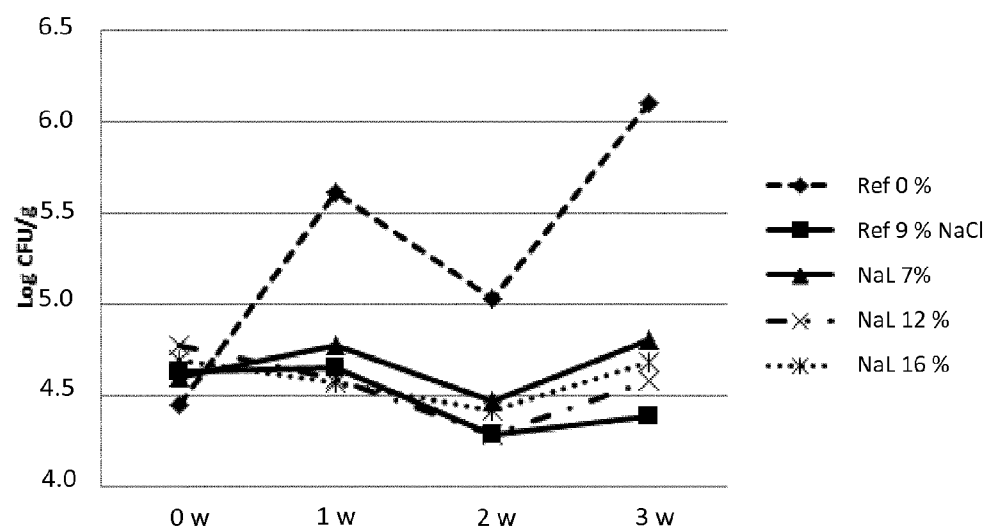


Figure 2

Bacterial count



A SMOKELESS TOBACCO COMPOSITION AND A METHOD FOR ITS MANUFACTURE

[0001] The present invention relates to a smokeless tobacco or non-tobacco snuff composition for oral use comprising at least 1 wt % lactic acid, or a salt thereof, based on the dry weight of the smokeless tobacco composition, as well as a method for its manufacture and the use of such composition.

BACKGROUND

[0002] Smokeless tobacco or non-tobacco snuff products for oral use comprise finely divided, particulate, such as ground, or cut, tobacco or non-tobacco material or a combination thereof that is not intended for combustion but designed to be placed in the oral cavity of a user for a period of time.

[0003] There are many various forms of smokeless tobacco or non-tobacco products for oral use. Such forms include chewing tobacco and tobacco or non-tobacco snuff. Snuff is available in two forms, as dry snuff for oral or nasal use and moist (or wet) snuff. There are two types of moist snuff, the American and the Scandinavian type. American-type moist snuff is available in a loose form or as pre-packed pouches and is typically used between the lower gum and lip. The use of American-type moist snuff is commonly called dipping. Snus is the Scandinavian-type of moist snuff which is also available in loose form or as pre-packed portions in pouches. Snus is typically used between the upper gum and lip.

[0004] There are a number of properties of the smokeless tobacco or non-tobacco snuff products for oral use that are very important for the end user. Among them, the organoleptic properties, such as texture, aroma, taste, form and package of the product, are of high importance for the consumer.

[0005] There is a merit in offering a range of products with different organoleptic properties to the consumers.

SUMMARY OF THE INVENTION

[0006] The present invention relates to a smokeless tobacco or non-tobacco snuff composition for oral use comprising at least 1 wt % lactic acid or a salt thereof based on the dry weight of the smokeless tobacco composition. The invention further relates to a method for manufacturing such composition, the use of such composition and a pouch containing such composition.

[0007] The present invention is defined in the appended claims.

[0008] Thus, a first aspect of the present invention is a smokeless tobacco or non-tobacco snuff composition for oral use comprising at least 20 wt % water based on the total weight of the final composition, wherein the composition further comprises at least 1 wt % lactic acid or a salt thereof based on the dry weight of the final composition.

[0009] A second aspect of the present invention is a method for manufacturing of a smokeless tobacco or non-tobacco snuff composition comprising at least 20 wt % water based on the total weight of the final composition and at least 1 wt % lactic acid or a salt thereof based on the dry weight of the final composition, wherein the method comprises:

[0010] a) providing a tobacco or non-tobacco plant material;

[0011] b) processing the material provided in step a) and optionally other ingredients; and

[0012] c) optionally packing the smokeless tobacco or non-tobacco snuff composition, either in pouches, or as is, in cans, or boxes; wherein lactic acid or a salt thereof is added at one or more of the following steps:

[0013] i) prior to step b),

[0014] ii) during step b), and/or

[0015] iii) after step b).

[0016] A third aspect of the invention is the use of a smokeless tobacco or non-tobacco snuff composition according to the first aspect of the invention for making portion packets comprising said composition.

[0017] A fourth aspect of the present invention is a pouch containing a smokeless tobacco or non-tobacco snuff composition for oral use according to the first aspect of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] FIG. 1 shows the principle of the manufacturing process according to GothiaTek® standard, as used for the manufacturing of Scandinavian type moist snuff (snus).

[0019] FIG. 2 shows the bacterial growth in snus compositions comprising different salts in various amounts, where the compositions have been stored during 3 weeks at 22° C., 60% RH.

DETAILED DESCRIPTION OF THE INVENTION

[0020] It is intended throughout the present description that the expression “tobacco” stands for any part, e.g. leaves and stems, of any member of the genus *Nicotiana*. The tobacco may be whole, shredded, threshed, cut, ground, cured, aged, fermented, or otherwise, e.g. granulated or encapsulated. Tobacco may also be in the form of finished products, including any smokeless tobacco composition that is orally consumed. Such smokeless tobacco compositions include snuff and chewing tobacco.

[0021] “Non-tobacco snuff” as used herein is used for a snuff composition that does not comprise tobacco but resembles a tobacco snuff composition in that it has similar texture, color, taste, flavor and mouthfeel. Non-tobacco snuff compositions are usually based on non-tobacco plant fibers. Examples of non-tobacco plant materials are oat fibers, apple fibers, sugar beet fibers, potato fibers, corn fibers, buckwheat fibers, cocoa fibers, and cellulose fibers. Smokeless non-tobacco snuff products for oral use are used in the same manner as the corresponding smokeless tobacco products for oral use.

[0022] Snuff is available in two forms, as dry nasal snuff for sniffing, and moist (or wet) snuff, such as snus, for use in the oral cavity by placing between the lip and gum.

[0023] Dry snuff for nasal use have a low water content, typically less than 10 wt %, and is commonly made from fire-cured fermented tobacco. The tobacco is ground into a powder and optionally other ingredients are added.

[0024] American-type moist snuff for oral use is commonly produced through a fermentation process of moisturized ground or cut tobacco. The water content is typically greater than 40 wt %. American-type moist snuff is available in a loose form or as pre-packed pouches and is most commonly used between the lower gum and lip but could also be used as snus between the upper gum and lip.

[0025] “Snus” as used herein denotes the Scandinavian type of moist snuff for oral use, which is produced in a heat-treatment process instead of by fermentation. The

tobacco or non-tobacco snuff product may be provided in particulate form, as a loose powder, or portion packed in a pouch. The final water content is typically greater than 40 wt %, but semi-dry products having less than 40 wt % water content, such as a water content from about 20 wt %, are also available. Snus is typically used between the upper gum and lip.

[0026] “Oral” and “oral use” is in all contexts used herein as a description for use in the oral cavity, i.e. chewing purposes, or buccally placement, such as between the lip and gum.

[0027] As used herein, the expression “water content” means the total water content in a smokeless tobacco or non-tobacco snuff composition including natural water contained in the materials used in the composition, as well as added pure water, as measured by using a standardized method for water analysis, such as, Karl Fischer titration or gas chromatography (GC). The water content is given herein as percent by weight (wt %).

[0028] Smokeless tobacco or non-tobacco snuff products for oral use may have a water content ranging from around 10 wt % for very dry products and up to about 65 wt % based on the total weight of the final composition, usually from 20 to 60 wt %, or from 30 to 60 wt %. The water holding capacity of the tobacco or non-tobacco snuff compositions affects the moist feeling of the product. A composition having a high water holding capacity can feel more dry than a composition with a lower water holding capacity, although both compositions have the same water content. Some consumers prefer products that are more dry while others prefer more moist products.

[0029] “Water activity” (a_w) is defined as the vapour pressure above a sample divided by the vapour pressure of pure water at the same temperature. The water activity is related to the water content of a sample in a non-linear relationship. Water activity values are obtained by either a capacitance or a dew point hygrometer. The water activity, as used herein, is measured with a Decagon AquaLab series 3 instrument that employs a cold mirror/dew point technique and is calibrated with certified standard solutions.

[0030] The term “dry weight”, as used herein, incorporates the common usage of the term and, in the context of the smokeless tobacco or non-tobacco snuff products disclosed herein, means the weight of a smokeless tobacco or non-tobacco snuff product after substantially all of the water or any other liquid has been removed.

[0031] The smokeless tobacco or non-tobacco snuff composition for oral use according to the present invention comprises at least 20 wt %, at least 25 wt %, at least 30 wt %, at least 35 wt %, at least 40 wt %, at least 50 wt % water, or at least 55 wt % water, based on the total weight of the final composition, and at least 1 wt % lactic acid or a salt thereof based on the dry weight of the final composition.

[0032] The composition according to the present invention may comprise not more than 70 wt % water, or not more than 65 wt %, or not more than 60 wt % water, based on the total weight of the final composition.

[0033] A particular problem for the manufacturing of semi-dry and moist smokeless tobacco or non-tobacco snuff products, such as products containing about 20 wt % water or more, for example products containing about 30 wt % water or more, based on the total weight of the final composition, is to provide a composition wherein microbial growth is avoided. The water activity of a composition is one important factor known to affect the microbial growth (L. B. Rockland,

et al.: *Water activity: Theory and application to food*, IFT Basic Symposium Series, Marcel Dekker Inc. ISBN 0-8247-7759-X; and G. L. Robertson, *Food Packaging. Principles and Practice*, Marcel Dekker inc. ISBN 0-8247-0175-5).

[0034] Sodium chloride, NaCl, is an additive used in moist smokeless tobacco or non-tobacco snuff compositions for oral use as a preservative for preventing microbial growth, such as growth of bacteria, in general by decreasing the water activity. The use of sodium chloride may render the composition a salty taste.

[0035] The natural occurrence of NaCl in tobacco, such as in tobacco lamina and stem, is below 1 wt %, typically below 0.5 wt % based on the dry weight of the tobacco.

[0036] The amount of NaCl needed to achieve an antimicrobial effect depends on the water content of the smokeless tobacco or non-tobacco snuff composition.

[0037] Smokeless tobacco or non-tobacco snuff compositions comprising less than 20 wt % water based on the total weight of the final composition may not need any addition of NaCl in order to prevent microbial growth. However, commercially available smokeless tobacco or non-tobacco snuff compositions for oral use that comprises more than 20 wt % water, based on the total weight of the final composition, typically comprise at least 4 wt % NaCl, based on the dry weight of the final composition while compositions comprising more than 50 wt % water based on the total weight of the final composition typically comprise more than 8 wt % NaCl based on the dry weight of the final composition. These amounts of NaCl are usually needed to achieve an antimicrobial effect. However, a composition comprising such amount of NaCl may be perceived too salty by many consumers.

[0038] By reducing the content of NaCl in a smokeless tobacco or non-tobacco snuff composition for oral use it may obtain a less salty taste, but it would also be expected that the water activity (a_w) would increase, and also the probability for microbial growth, compared with a corresponding composition having the same water content but a greater content of NaCl. When the a_w is above 0.90 for a smokeless tobacco or non-tobacco snuff composition for oral use, such as in compositions with a relatively high water content, for example comprising at least 30 wt % water based on the total weight of the final composition, such as Swedish snus, the risk for microbial growth in the product increases. An a_w of 0.92 would normally result in strong microbial growth.

[0039] Compositions according to the present invention show negligible or a very limited microbial growth even though these compositions may have an increased water activity, such as an a_w of 0.92.

[0040] An advantage with lactic acid or a salt thereof is that it has a neutral taste in addition to its ability to limit the microbial growth in a composition according to the present invention.

[0041] The amount of lactic acid or a salt thereof that is needed in a smokeless tobacco or non-tobacco snuff composition for oral use to provide a desired water activity and to achieve an antimicrobial effect depends on the water content of the composition and, if NaCl is added, the amount of NaCl.

[0042] The smokeless tobacco or non-tobacco snuff composition for oral use according to the present invention comprises at least 1 wt % lactic acid or a salt thereof, at least 2 wt %, at least 3 wt %, at least 4 wt %, at least 5 wt %, at least 6 wt %, at least 7 wt %, at least 10 wt %, at least 12 wt %, at least 15 wt %, or at least 20 wt %, based on the dry weight of the final composition. The natural occurrence of lactic acid or a

salt thereof in smokeless tobacco or non-tobacco snuff composition for oral use is typically below 1 wt %, or even below 0.5 wt %.

[0043] The composition according to the present invention may comprise not more than 30 wt % lactic acid or a salt thereof, not more than 25 wt %, or not more than 20 wt %, based on the dry weight of the final composition.

[0044] Salts of lactic acid that are suitable in the composition according to the present invention may be lactate salts of an alkali metal, such as sodium lactate or potassium lactate, and more specifically sodium lactate.

[0045] An advantage with a smokeless tobacco or non-tobacco snuff composition for oral use according to the present invention is that by adding lactic acid or a salt thereof, the amount NaCl in a composition may be lowered without risk for increased microbial growth. Compositions according to the present invention may therefore be provided with a less salty taste compared to corresponding compositions without lactic acid or a salt thereof, while the microbial growth is maintained at the same level.

[0046] A smokeless tobacco or non-tobacco snuff composition according to the present invention may comprise less than 8 wt % NaCl, less than 4 wt % NaCl, or less than 1 wt % NaCl, based on the dry weight of the final composition.

[0047] With the use of lactic acid or a salt thereof in a smokeless tobacco or non-tobacco snuff composition according to the present invention it is possible to achieve an antimicrobial effect even without any addition of NaCl.

[0048] The greater the amount of water and the lower the amount of NaCl in a tobacco or non-tobacco snuff composition for oral use, the greater amount of lactic acid may be required to avoid microbial growth.

[0049] Lactic acid and salts thereof have been reported to decrease microbiological growth at a low pH, such as pH 7.25 or lower (De Wit, J. C., et al. 1990, *Food Microbiol.*, 7:113-120; and Shelef, L. A. 1994, *J. Food Prof.*, 57:445-450). Further reports show that the antimicrobial effect tends to increase with lower pH (Houtsma, 1996, Ph.D. thesis, Agricultural University Wageningen). In an acidic environment lactic acid is undissociated, and can diffuse into the microbial cell wherein it subsequently has an antimicrobial effect.

[0050] The pH of smokeless tobacco or non-tobacco snuff compositions for oral use is typically higher than pH 7.5, typically higher than pH 8. Therefore it was not expected that a composition according to the present invention would show a negligible microbial growth, as is shown in Table 1 and FIG. 2.

[0051] The smokeless tobacco or non-tobacco snuff composition for oral use according to the present invention may have a pH of at least 7.5, or at least 8. The pH may not be higher than 9.8, or preferably not higher than 9.5. The composition preferably has a pH in the range from 7.5 to 9.8, or in the range from 8 to 9.5.

[0052] Another advantage with the use of lactic acid or a salt thereof in the smokeless tobacco or non-tobacco snuff composition of the present invention is that they might be used in effective amounts without being subject to regulatory restrictions. Other preservatives, such as salts of sorbic and propionic acids, may be subject to regulatory requirements in certain jurisdictions and may not provide any antimicrobial effect even when used at their maximal allowed concentration according to said regulation requirements. With a composition according to the present invention the amount of preservatives, such as sorbates, e.g. potassium sorbate; propionates, e.g. sodium propionate; or benzoic acid or salts thereof may be completely avoided or reduced without increasing the risk for microbial growth. Thus, the smokeless tobacco or non-

tobacco snuff compositions for oral use according to the present invention may comprise no preservatives selected from the group consisting of sorbates, propionates, and benzoic acid or salts thereof.

[0053] A further advantage of using of lactic acid or a salt thereof in the smokeless tobacco or non-tobacco snuff composition of the present invention is that it alters the consistency of the composition so that it becomes more cohesive than a composition with the same water content but without lactic acid or a salt thereof. Thus, the water content of the composition according to the present invention can be reduced while preserving the same consistency as perceived by the consumer. A reduced water content has the further advantage that it also may contribute to a reduced microbial growth since the water activity will be decreased.

[0054] A more cohesive texture of smokeless tobacco or non-tobacco snuff compositions for oral use with a reduced water content may also be an advantage during manufacture, such that it is possible to pack in pouches at a lower water content than would normally be possible. A process for making pouches of a smokeless tobacco or a non-tobacco snuff composition for oral use is described in U.S. Pat. No. 6,135,120.

[0055] Further, because of the increased cohesive texture when lactic acid or a salt thereof is added to a smokeless tobacco or non-tobacco snuff composition for oral use according to the present invention it is easier to form the composition into a portion packet or a pinch, compared with a corresponding composition for oral use with the same water content but without the addition of lactic acid or a salt thereof.

[0056] The composition for oral use according to the present invention is preferably a smokeless tobacco composition, such as snus.

[0057] The smokeless tobacco or non-tobacco snuff composition for oral use according to the present invention may be provided in form of pouches, or as is in particular form in cans or boxes.

[0058] A general description of snus manufacturing is presented by e.g. ESTOC, European Smokeless Tobacco Council, and the GothiaTek® quality standard for snus. Methods for the manufacture of American type moist snuff and chewing tobacco are described in e.g. 'Wahlberg, I., Ringberger, T. (1999) Smokeless Tobacco. In: Tobacco: *Production, Chemistry and Technology*, (eds D. L. Davis & M. T. Nielsen) pp. 452-460. World Agriculture Series, Blackwell Science Ltd.

[0059] The smokeless tobacco or non-tobacco snuff composition according to the present invention may be manufactured according to the GothiaTek® standard.

[0060] A second aspect of the present invention is a method for manufacturing of a smokeless tobacco or non-tobacco snuff composition for oral use according to the first aspect of the invention, wherein the method comprises:

- [0061]** a) providing a tobacco material or non-tobacco plant fibre material;
- [0062]** b) processing the material provided in step a) and optionally other ingredients; and
- [0063]** c) optionally packing the smokeless tobacco or non-tobacco snuff composition, either in pouches, or as is, in cans, or boxes;

wherein lactic acid or a salt thereof is added at one or more of the following steps:

- [0064]** i) prior to step b),
- [0065]** ii) during step b), and/or
- [0066]** iii) after step b).

[0067] The processing of the material in step b) may comprise a heat treatment, such as a pasteurization process.

[0068] In the method according to the present invention the lactic acid or a salt thereof may be added prior to step b), during step b), or after step b).

[0069] Prior to the processing of the tobacco material or non-tobacco plant fiber material in step b) water and possibly additional additives may be added. During the processing of the tobacco material or non-tobacco plant fiber material in step b) water, flavors, sodium carbonate and possibly additional additives may be added.

EXAMPLES

Example 1

[0070] 3000 g snus was produced in accordance with a modified version of the GothiaTek® standard. The method was modified by omitting the addition of sodium chloride before heat treatment. A mixture of ground tobacco and water was heat-treated at a temperature of 100° C. for 2 hours and thereafter at a declining temperature of from 100° C. to 70° C. for 8 hours, reaching a water content of about 42 wt % of the total weight of the final composition. After the heat-treatment, the mixture was chilled to about 20° C. and sodium carbonate was added to adjust the mixture to an alkaline pH of about 8.3 and water was added to adjust the water content to about 50 wt % based on the total weight of the final composition. The resulting base snus had a water content of 51.2 wt % and a pH value of 8.33. A bacteria culture, with *bacillus* bacteria, known to be able to reproduce in snus environment, was added to the snus base. This resulted in a bacterial count in the snus base of about log 4.5 CFU/g snus.

[0071] From this snus a 250 g reference sample (NaCl 9%) was produced by addition of a water solution with sodium chloride to produce snus with a water content of about 57 wt % based on the total weight of the final composition and containing 9 wt % NaCl based on the dry weight of the formulation. This corresponds to a concentration of NaCl and a water content commonly used in Swedish type snus. Further, from the same base snus, a second reference sample (Ref 0%) of 250 g was prepared by addition of water to obtain a snus with about 57% water content, but containing no added NaCl. Further, from the same base snus, three 250 g snus samples were prepared by addition of water solutions with sodium lactate (NaL) to produce snus with a water content of about 57 wt % based on the total weight of the final composition and containing 7, 12 and 16 wt % sodium lactate based on the dry weight of the formulation. The samples are called NaL 7%, NaL 12% and NaL 16%, respectively.

[0072] All samples were analyzed regarding pH, water content, water activity (a_w) and bacterial count before they were packed and stored. The pH and water activity for each sample are presented in Table 1. The samples were then packed into sealed plastic bags and transferred to a controlled climate (22° C., 60% RH) where they were stored for 3 weeks. After 1, 2 and 3 weeks of storage the samples were analyzed for pH and bacterial count. The pH for all samples remained above 7.7. The bacterial count results, shown in FIG. 2, clearly show a bacteriostatic effect of addition of sodium lactate in snus in all three samples. In general, Swedish snus products require a water activity of no more than 0.90 to ensure that no bacterial growth takes place. Samples NaL 7% and NaL 12% have a water activity of 0.92, as presented in Table 1, which would

suggest strong bacterial growth, but unexpectedly these samples exhibit a static bacterial count as presented in FIG. 2. This indicates an antibacterial effect beyond the a_w lowering effect.

TABLE 1

Sample	Added Salt	Added amount of salt (wt %)	pH	Water activity (a_w)
Ref 0% (reference)	No addition	0	8.32	0.93
Ref 9% NaCl (reference)	NaCl	9	8.33	0.9
NaL 7%	NaL	7	8.27	0.92
NaL 12%	NaL	12	8.23	0.92
NaL 16%	NaL	16	8.22	0.9

1. A smokeless tobacco or non-tobacco snuff composition for oral use, comprising:

- at least 20 percent water based on the total weight of the final composition, and
- at least one percent lactic acid or a salt thereof based on the dry weight of the final composition.

2.-14. (canceled)

15. The composition according to claim 1, wherein the composition comprises at least 30 percent water based on the total weight of the final composition.

16. The composition according to claim 1, wherein the composition comprises less than four percent NaCl based on the dry weight of the final composition.

17. The composition according to claim 1, wherein the composition comprises less than one percent NaCl based on the dry weight of the final composition.

18. The composition according to claim 1, wherein the composition comprises at least six percent lactic acid or a salt thereof based on the dry weight of the final composition.

19. The composition according to claim 1, wherein the composition comprises at least ten percent lactic acid or a salt thereof based on, the dry weight of the final composition.

20. The composition according to claim 1, wherein the lactic acid or a salt thereof is sodium lactate.

21. The composition according to claim 1, wherein the composition has a pH of at least 7.5 and less than 9.8.

22. The composition according to claim 1, wherein the composition is a smokeless tobacco composition for oral use.

23. The composition according to claim 22, wherein the composition is snus.

24. The composition according to claim 1, wherein the composition does not comprise a preservative selected from the group consisting of sorbates, propionates, and benzoic acid or salts thereof.

25. A method for manufacturing the smokeless tobacco or non-tobacco snuff composition of claim 1, comprising:

- a) providing a tobacco or non-tobacco plant material;
- b) processing the material provided in step a); and
- c) adding lactic acid to the composition either before, during, or after the processing step at one or more of the following steps.

26. The composition according to claim 1, wherein the composition is packaged into portion packets.

27. The composition according to claim 1, wherein the composition is packaged into pouches.

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