A method for continuously processing meat substrates, such as poultry, includes placing a meat substrate in a package sized to contain the meat substrate and a predetermined amount of a marinade. The marinade generally comprises a solute and water, but optionally includes a soluble or insoluble seasoning and other ingredients. Preferably, the marinade also includes a thickening agent, such as modified food starch and xanthan gum, to increase its viscosity to minimize leaching. After the predetermined amount of marinade is added to the package, the package is then sealed. Preferably, the volume of the sealed package is substantially equal to the sum of the volume of the meat substrate and the predetermined amount of marinade. When the marinade includes an insoluble seasoning, it is desirable to add a fraction of the marinade, then place the meat substrate in the package, and then add the remainder of the marinade.

METHOD FOR CONTINUOUSLY PROCESSING MEAT SUBSTRATES USING A MARINADE WITH INCREASED VISCOSITY

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ABSTRACT

Related U.S. Application Data

Continuation-in-part of application No. 11/204,080, filed on Aug. 15, 2005.
Select marinade

Create package

Place meat substrate into package

Add predetermined amount of marinade into package

Cover and seal package

FIG. 1
Select marinade

Create package

Add fraction of predetermined amount of marinade into package

Place meat substrate into package

Add remaining predetermined amount of marinade into package

Cover and seal package

FIG. 2
METHOD FOR CONTINUOUSLY PROCESSING MEAT SUBSTRATES USING A MARINADE WITH INCREASED VISCOSITY

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part of U.S. patent application Ser. No. 11/204,080, filed on Dec. 6, 2005.

FIELD OF INVENTION

[0002] The present invention relates to methods for continuously processing meat substrates. More specifically, the present invention relates to continuously marinating and packaging meat substrates, such as portions of poultry.

BACKGROUND OF THE INVENTION

[0003] Meat processors often utilize various techniques to enhance and add value to their food products, such as by applying marinade to meat substrates. The procedure for applying marinade to meat substrates may take one or multiple steps based on the size of the substrate, the marinade composition, and the desired level of marination. In the food processing industry, there are various approaches to marinating meat substrates and the processes are selected according to the type of product desired and the composition of the marinade. Such processes include marinating, tumbling, vacuum tumbling, injecting, or a combination of these techniques.

[0004] One of the more commonly-used methods of marination is tumbling. Marination by tumbling typically involves a batch process in which large quantities of meat substrates are combined with a marinade in a mechanical tumbler. As the tumbler is agitated, the marinade and meat substrates are mixed, and the marinade is absorbed by the meat substrates. The method of marination by vacuum tumbling uses a sealed chamber in which the marinade and meat substrates are placed. Air is partially evacuated, and the chamber is agitated to increase the rate of marination absorption by the meat substrates.

[0005] Another commonly-used method of marination is injection. Marination by injection uses needles to inject a predetermined volume of marinade directly into the meat substrates. Regardless of the method used, all known currently utilized processes substantially complete marination of the meat substrates prior to placing and sealing the substrates into packages.

[0006] Currently utilized marination techniques often result in inconsistently marinated, non-aesthetically pleasing products and may contribute to significant waste of marinade. Furthermore, these processes often require multiple pieces of equipment for marinating and packaging the meat substrates. Moreover, the prior art processes often require binders, such as phosphates, to ensure that a sufficient amount of marinade is retained in the meat substrate. The use of binders is increasingly being viewed as a negative and can adversely affect the sales of the product.

[0007] Accordingly, there is a need in the art for a method to efficiently marinate and package meat substrates. There is also a need for a marination method which provides consistently-marinated products. It is also desirable to reduce the number of pieces of equipment used in current marination and packaging processes. Moreover, it is also desirable to provide a method which can be used to adequately marinate a meat substrate without the use of binders.

SUMMARY OF THE INVENTION

[0008] In view of the shortcomings of the prior art processes, an embodiment of the present invention relates to a method for continuously processing meat substrates including the step of placing a meat substrate in a package which is sized to contain the meat substrate and a predetermined amount of marinade, which comprises at least a solute and water, and optionally a thickening agent. The predetermined amount of marinade is selected to be substantially absorbed by the meat substrate. The method includes the step of adding the predetermined amount of marinade to the package, which is then sealed to allow the marinade to be substantially absorbed by the meat substrate while the package is sealed.

[0009] According to a second embodiment of the present invention, the method includes the step of placing a meat substrate into a package which is sized to contain the meat substrate and a predetermined amount of marinade, which consists essentially of a solute, a thickening agent, water, and, optionally, a soluble seasoning. The predetermined amount of marinade is selected to be substantially absorbed by the meat substrate. The method includes the step of adding the predetermined amount of marinade to the package, which is then sealed to allow the marinade to be substantially absorbed by the meat substrate while the package is sealed.

[0010] According to a third embodiment of the present invention, the method includes the step of placing a fraction of a predetermined amount of marinade in a package which is sized to contain a meat substrate and a predetermined amount of marinade, which comprises at least a solute, a thickening agent, and water and, optionally, has an insoluble seasoning dispersed therein. The predetermined amount of marinade is selected to be substantially absorbed by the meat substrate. The meat substrate is then added to the partially filled package to provide a meat-containing package. Then, the remainder of the predetermined amount of marinade is added into the package, which is sealed to allow the marinade to be substantially absorbed by the meat substrate while the package is sealed.

[0011] According to a fourth embodiment of the present invention, the method includes the step of placing a fraction of a predetermined amount of marinade in a package which is sized to contain a meat substrate and a predetermined amount of marinade, which consists essentially of a solute, a thickening agent, water, and, optionally a soluble seasoning and has an insoluble seasoning dispersed therein. The predetermined amount of marinade is selected to be substantially absorbed by the meat substrate. The meat substrate is then added to the partially filled package and the remainder of the predetermined amount of marinade is added into the package, which is sealed to allow the marinade to be substantially absorbed by the meat substrate while the package is sealed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The features of the invention and the elements characteristic of the invention are set forth with particularity
in the appended claims. The invention itself, however, may best be understood by reference to the detailed description which follows when taken in conjunction with the accompanying drawings in which:

[0013] FIG. 1 is a flow-chart describing a method for continuously processing meat substrates according to an embodiment of the present invention; and

[0014] FIG. 2 is a flow-chart describing a method for continuously processing meat substrates according to another embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0015] The present invention is directed to a method for continuously processing meat substrates. As used herein, the term “processing” primarily means marinating and packaging, but can also encompass other process steps, including additional, optional steps done before and after the marinating and packaging steps. Such preliminary steps include marinating, scoring, or tenderizing the meat substrate; cutting the meat substrate; trimming the meat substrate; and cooking the meat substrate, including freezing and/or cooking it while it is still contained within the package. In addition, while the process is primarily directed to effecting marination without the use of injection or tumbling, the inventive process of the present invention can be used in conjunction with an injection, tumbling, or other marination process.

Any edible meat substrate can be processed in accordance with the present invention. Examples of such meat substrates include portions of poultry, beef, pork, veal, or seafood and may be a single cut of meat or portions thereof. Poultry includes chicken, turkey, and Cornish hens, among others. In addition, it is provided that the meat substrate can be a bone-in or boneless meat substrate. The meat substrate may be skinless or skin-on. It is primarily envisioned that the present invention be used to process whole muscle meat, but the method can also be used to process other types of meat substrates. In one embodiment of the invention, the method is used to process a portion of poultry, such as chicken, and in a more specific embodiment of the invention, the method is used to process a chicken breast.

[0017] The method is a continuous process as opposed to a batch process, such as many known tumbling marination processes. The various steps of the method are carried out as part of a continuous process. For example, the method can be carried out using any suitable rollstock machine preferably having a conveyor belt, such as commercially available rollstock machines manufactured by Multivac Inc. of Kansas City, Mo.; Rapid Pak of Lodi, Wis.; and Reiser of Canton, Mass. An embodiment for processing chicken breasts, an R530 rollstock machine, manufactured by Multivac, is used.

[0018] The marinade used can be any known marinade used to tenderize, moisten, and/or flavor the meat substrate. In its most general sense, the marinade includes a solute, such as salt (which typically is sodium chloride but could also be or include potassium chloride, among others), and water. Such a marinade serves primarily to tenderize the meat and increase the water-holding capacity of the meat, thereby allowing for a cooked product having increased moistness. The marinade may also include one or more soluble seasonings primarily for imparting flavor to the meat. For example, soluble seasonings can be used to impart any of a wide variety of flavors to the meat substrate, such as barbecue, Italian, honey-mustard, teriyaki, tomato basil, and lemon pepper, among others. Seasonings include ingredients such as sweeteners, starches, soy proteins, and hydrocolloids. While the term “soluble seasoning” is used, such seasonings encompass seasonings which are typically added to water either as a dry powder or as a liquid. While binders, such as phosphates, can also be included in the marinade, it is generally preferable to provide a marinade which consists of a solute, water, and optionally a soluble seasoning, to the exclusion of any binders. It has been found that the method of the present invention can achieve a significant degree of marinade absorption without the use of binders, thereby minimizing the waste of marinade while avoiding the negative attributes associated with using binders.

[0019] The embodiment shown in FIG. 2 is particularly well-suited to using a marinade which also has insoluble seasonings dispersed therein. Insoluble seasonings are seasonings not capable of being dissolved in water under normal process conditions and are typically used to tenderize the meat, impart color to the surface of the meat, and/or flavor the meat. They include, for example, oregano, pepper, parsley, and basil. The marinades used with any embodiment of this invention can also include other ingredients typically used in marinades. A traditional type of marinade, for example, may include a solution of oil, sugar, salt, herbs and spices. Other marinades may also contain acidic solutions, such as vinegar, wine, or fruit juice, to tenderize the meat. In a preferred embodiment in which the method is used to process a chicken breast, the marinade includes salt, water, oregano, cheeses, and dehydrated vegetables.

[0020] Turning now to the embodiment shown in FIG. 1, in step 100, a marinade is selected to be applied to a meat substrate. According to this embodiment of the invention, the marinade is any marinade discussed above but preferably does not include any insoluble seasonings, although it can.

[0021] In step 102, a package to hold the meat substrate and marinade is created. Any suitable material can be used for the package so long as it is food-compatible and generally impermeable to liquids to ensure that the marinade is retained. The material of the package can be any known suitable material, such as polyester or polyamide (e.g., nylon 66) or a composite blend. Preferably, the material or materials selected have a high melting temperature (e.g., over 500° F.) to allow a meat substrate to be cooked inside the package. The material of the package can be vapor permeable or impermeable.

[0022] The package may also be flexible, semi-rigid (i.e., flexible but able to hold a shape), or rigid. In an embodiment using a Multivac R530 rollstock machine, the package comprises a film forming material and a cover film, such as (1) a coextruded forming web with a polypropylene skin and a Plastomer sealant and (2) a coextruded web with a Nylon skin, a Plastomer sealant and an EVOH barrier, respectively, manufactured by Cryovac of Saddle Brook, N.J. A punch, preferably in the same general, or even nearly exact, shape of the meat substrate is used to form a depression in the film
forming material, and the cover film is applied over it and sealed to it as discussed below.

0023 The package is sized to contain the meat substrate and a predetermined amount of the marinade. In a preferred embodiment, the volume of the sealed package exceeds the sum of the volume of the meat (prior to absorption of the marinade) and the volume of the predetermined amount of the marinade by about 0.1% to about 10%. Even more preferably, the sealed package volume is substantially equal to the sum of the volume of the meat and the volume of the predetermined amount of the marinade. More preferably, the package is also in the same general shape as the outer contours of the meat substrate. In this way, the marinade is generally evenly dispersed between the periphery of the meat substrate and the package. This shaping can be effected, for example, by making the package in a shape to match the shape of the meat substrate (e.g., by using a suitably-shaped punch as mentioned above) and/or by pulling a vacuum evenly over the package interior during sealing, as discussed below.

0024 The predetermined amount of marinade is selected based on a number of factors including the absorptivity of the particular marinade in the particular meat substrate, the desired extent of marination, the conditions (e.g., temperature and time) during marination, and the maximum allowable percentage of marinade in the particular food product. It is desirable that the predetermined amount of marinade is selected to be at or near the maximum amount of marinade which can be absorbed by the meat substrate. Preferably, the predetermined amount of marinade is substantially or completely absorbed by the meat substrate within about 24-72 hours at refrigerated conditions (e.g., 28-40°F) with no tumbling of the bag. Of course, the rate of absorption is increased if the sealed bags are tumbled. It is preferred, however, that the predetermined amount of marinade is selected such that 80 to 90% (by weight) of the predetermined amount is absorbed by the meat substrate after 72 hours under refrigerated conditions, with the most preferred range being 85 to 95% (by weight) absorption after 72 hours under refrigerated conditions. The fullest extent of absorption should occur in most circumstances after 72 hours.

0025 In step 104, meat substrate is placed into the package. Prior to being placed in the package, the meat substrate may also be macerated, scored, or tenderized. When using a Multivac R530 rollstock machine, the meat substrate is automatically placed in each package as it is conveyed along the line. Alternatively, the meat substrate can be placed in the package manually. The meat substrate placed in the package can be a wide variety of types of meat substrates, including a single cut of meat (e.g., a chicken breast or a drumstick) or multiple meat cuts and whole muscle meat or processed meat.

0026 Step 106 follows placing the meat substrate into the package. In this step, the predeterminend amount of marinade is added to the package, for example by manually pouring the predetermined amount of marinade over the meat substrate and into the package interior. More preferably, this can be done in an automated fashion, using any number of known volumetric filling machines, for example those commercially available from Hinds-boch of Redmond, Wash. In one embodiment for coating a boneless chicken breast of about 3-5 oz, approximately 15-22 grams of marinade (including the weight of any insoluble seasonings dispersed therein) may be used. In particular, it has been found that sufficient marinade is added to achieve approximately 16-20% of the weight of the chicken breast, preferably 18%, although this percentage will vary depending on the desired flavor and moistness of the final product. In another embodiment, 19 grams of marinade are used to marinate a chicken breast having a weight of 4 oz.

0027 In step 108, the package is sealed. For example, in an embodiment using a Multivac R530 rollstock machine, the sealing step involves first covering the package interior containing the meat substrate and the predetermined amount of marinade with a cover film, then a vacuum is applied to the interior and the package is heat-sealed while under vacuum. Vacuum sealing is especially advantageous to cause the shape of the package to conform evenly with the shape of the meat product and to reduce the amount of oxygen in the package, thereby slowing degradation of the meat substrate. Controlling the extent of vacuum sealing can also permit the proper adjustment of the package volume after sealing relative to the sum of the meat volume and the marinade volume. For example, it has been found that using a vacuum of approximately 15-25 millibars causes the volume of the package to become approximately equal to the sum of the meat volume and the marinade volume for marinating a chicken breast of 3-5 oz using a Multivac R530 rollstock machine. The material used for the cover film to cover the package can be a similar or different material used when creating the package. When sealing the package, various methods can be used such as vacuum and/or heat sealing, among others.

0028 In the sealed package, the marinade is completely or substantially absorbed by the meat substrate while the package remains sealed. After sealing, the meat substrate and marinade may be cooked within the package. Preferably, the package has some way in which to allow easy opening of the package, such as by having a corner of the package not adhered together to allow the cover to be peeled away from the bottom of the package.

0029 The alternative embodiment shown in FIG. 2 is particularly suitable for use when the marinade has an insoluble seasoning, such as pepper or oregano, dispersed therein. This embodiment is desirable in this case because in the first embodiment, when a marinade having insoluble seasonings is applied only to the top side of a meat substrate, the insoluble seasoning primarily coats only the top side. In this embodiment, the steps of selecting the marinade 200, creating the package 202, placing the meat in the substrate 206, and covering and sealing 210 are very similar to or identical to steps 100, 102, 104, and 108, respectively, as discussed in connection with FIG. 1 above.

0030 In step 204, a fraction of a predetermined amount of marinade is added into the package followed by an amount of meat substrate during step 206. The remaining predetermined amount of marinade is added into the package (preferably primarily or solely to the top side of the meat substrate) in step 208 which is covered and sealed in step 210. Other than dividing up the step into the application of two fractions of the predetermined amount of marinade, these steps are otherwise like step 106. The fraction of the predetermined amount of marinade should roughly correspond to the surface areas of the two sides (top and bottom) of the meat substrate, and conveniently is often chosen to be 50%.

0031 In embodiments of the present invention in which the marinades are introduced into the package using automated filling machines, it has been determined that marinades having viscosities greater than water (i.e. approxi-
mately 1 centipoise (cp)) are particularly useful. At a viscosity of about that of water, the higher fluidity of the marinade in some systems becomes problematic as the marinade has a tendency to leak from conventional filling machines, particularly those having dispensing nozzles. Therefore, the minimum desired viscosity is a viscosity at which minimal leaking of the marinade from conventional automated filling machines occurs. Accordingly, such marinades are defined herein as having a viscosity sufficient to provide substantially no leaking, and preferably no visible leaking during processing. Another characteristic of the marinade to be applied to the meat substrate using automated filling machines is that because the marinade is a shear thickening material, it will thicken, or become more viscous, as it is mixed over time. As one skilled in the art would appreciate, such shear thickening could become problematic if the viscosity of the marinade becomes too high for the marinade to be pumped through the filling machine system. For many systems, a suitable marinade is one which has a viscosity, immediately after becoming well-mixed, of at least about 100 cp, preferably at least about 150 cp, measured using a Brookfield viscometer model LVDV-1+ operating at 50 rpm and at a torque of about 28% at about 36°F. It has been found that the formulation as set forth below minimizes this potential adverse effect.

To achieve a viscosity having the above-noted advantages, the marinade of the present invention is made to further include a thickening agent. The thickening agent may include xanthan gum, a modified food starch or combinations thereof. One example of a modified food starch that may be used in the marinade of the present invention is waxy maize modified corn starch (supplied by National Starch and Chemical Company of Bridgewater, N.J.). Another thickening agent that may be used in the marinade is HYDROB-IND® carrot fiber ( supplied by Bolkhouse Farms, of Bakersfield, Calif.). Other suitable thickening agents may also be used.

One embodiment of a marinade having a viscosity suitable for use in the present invention comprises a dry blend including salt, modified food starch and xanthan gum mixed with water. In the dry blend, the salt may be present in an amount of from about 76.0 to 81.0% by weight, the modified food starch may be present in an amount of from about 17.0 to 22.0% by weight and the xanthan gum may be present in an amount of from about 0.5 to 3.5% by weight. The dry blend is then well-mixed with a predetermined amount of water so as to dissolve the dry blend to produce the marinade.

An example of a marinade according to the above described embodiment includes the following ingredients:

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Weight (lbs)</th>
<th>Weight % to Batch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>9.23</td>
<td>92.30</td>
</tr>
<tr>
<td>Salt</td>
<td>0.605</td>
<td>6.05</td>
</tr>
<tr>
<td>Waxy Maize Modified Corn Starch</td>
<td>0.150</td>
<td>1.50</td>
</tr>
<tr>
<td>Xanthan Gum</td>
<td>0.015</td>
<td>0.15</td>
</tr>
<tr>
<td>Total</td>
<td>10.00 lbs</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

A marinade including these ingredients was tested to determine the viscosity of the marinade during typical plant operations. In an exemplary system for processing the exemplary marinade, the marinade was batched in a holding tank and was mixed by recirculation using a Waukesha Cherry-Darrell recirculation pump type C-216, serial number 37646-05, from Wolf-Tech, Inc. The pump has a capacity of 1-780 gpm, an operating speed of 1-3500 RPM-60 Hz and is operable over a viscosity range of 0-1500 cp. Other mixing systems, such as high-shear mixers or rotary mixers, may also be used to mix the components. In this system, the marinade was directed to dispensing nozzles of the filler machine, manufactured by Hinds-Bock Corporation having model number 6P-01 and serial number 0005013, where a predetermined amount of exemplary marinade was dispensed by the dispensing nozzles into the package containing the meat substrate.

To determine the viscosity of the marinade, the initial reading of the viscosity of the marinade was measured after 15 minutes of mixing after batching, to allow the constituents to become fully dissolved in the marinade solution and to allow the temperature of the marinade to reach the desired level. After an interval of time, such as thirty minutes, the viscosity was again measured. As expected, this second measurement had a viscosity value of the marinade higher than the first as a result of the shear thickening effect. According to the system described above, the viscosity of the marinade was sampled from the holding tank using Brookfield viscometer model LVDV-1+ over a time period of 150 minutes according to the test parameters shown in the following table:

<table>
<thead>
<tr>
<th>Viscosity Data</th>
<th>Time (minutes)</th>
<th>RPM</th>
<th>% Torque</th>
<th>Centipoise</th>
<th>Temperature of Sample (degrees F.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15</td>
<td>20</td>
<td>17.8</td>
<td>265.0</td>
<td>35.7</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>12.5</td>
<td>381.3</td>
<td>247.0</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>27.8</td>
<td>166.8</td>
<td>289.0</td>
<td>34.8</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>20</td>
<td>20.7</td>
<td>310.5</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>15.2</td>
<td>462.0</td>
<td>223.0</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>32.6</td>
<td>195.0</td>
<td>284.0</td>
<td>34.8</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>20</td>
<td>24.1</td>
<td>362.0</td>
<td>36.4</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>18.4</td>
<td>551.5</td>
<td>248.0</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>37.9</td>
<td>226.8</td>
<td>294.0</td>
<td>35.8</td>
</tr>
<tr>
<td></td>
<td>90</td>
<td>20</td>
<td>25.9</td>
<td>388.5</td>
<td>34.8</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>19.3</td>
<td>580.5</td>
<td>238.0</td>
<td>33.4</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>39.8</td>
<td>238.0</td>
<td>238.0</td>
<td>33.4</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>20</td>
<td>28.0</td>
<td>420.0</td>
<td>33.4</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>21.1</td>
<td>634.5</td>
<td>250.8</td>
<td>33.4</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>41.8</td>
<td>250.8</td>
<td>250.8</td>
<td>33.4</td>
</tr>
</tbody>
</table>
The results of the above exemplary marinade tested in accordance with the above-noted parameters indicated that the marinade had a viscosity sufficient to provide substantially no leaking of about 166.8 cp, when tested using Brookfield viscometer model LVDV-1* operating at 50 rpm and a 27.8% torque at 35.7° F. 15 minutes of mixing.

[0038] As can be appreciated, the various steps of the method of the present invention, such as placing the meat substrate in the package, adding the marinade to the package, and sealing the package can be done as part of a continuous process. Moreover, according to certain embodiments of the method of the present invention, tumblers and injectors are eliminated. Finally, certain embodiments of the present invention provide for the incorporation of a marinade into the matrix of the substrate and the coating of the substrate with insoluble particulates by the same step.

[0039] Although the present invention has been particularly described in conjunction with specific embodiments, it is evident that many alternatives, modifications, and variations will be apparent to those skilled in the art. It is therefore contemplated that the appended claims will embrace any such alternatives, modifications, and variations as falling within the true scope and spirit of the present invention.

What is claimed:
1. A method for continuously processing meat substrates, comprising the steps of:
   - placing a meat substrate in a package sized to contain the meat substrate and a predetermined amount of a marinade, wherein the marinade comprises a solute and water and wherein the predetermined amount is selected to be substantially absorbed by the meat substrate;
   - adding the predetermined amount of the marinade to the package; and
   - sealing the package to allow the marinade to be substantially absorbed by the meat substrate while sealed.
2. The method of claim 1 wherein the marinade further comprises a thickening agent.
3. The method of claim 2, wherein the thickening agent is selected from the group consisting of xanthan gum, a modified food starch and combinations thereof.
4. The method of claim 2, wherein the marinade has a viscosity sufficient to provide substantially no leaking.
5. The method according to claim 2, wherein the meat substrate is a bone-in meat substrate or a boneless meat substrate.
6. The method according to claim 2, wherein the meat substrate is a portion selected from the group consisting of poultry, beef, pork, lamb, veal, and seafood.
7. The method according to claim 2, wherein the meat substrate is a portion of poultry.
8. The method according to claim 2, wherein the meat substrate is a portion of chicken.
9. The method according to claim 2, wherein the package comprises a film forming material and a cover film, and the step of sealing the package comprises applying a vacuum to the package while sealing the cover film with the film forming material such that the sealed package volume exceeds the sum of the volume of the meat and the volume of the predetermined amount of the marinade by about 0.1% to about 10%.
10. The method according to claim 2, wherein the package comprises a film forming material and a cover film, and the step of sealing the package comprises applying a vacuum to the package while sealing the cover film with the film forming material such that the sealed package volume is substantially equal to the sum of the volume of the meat and the volume of the predetermined amount of the marinade.
11. The method according to claim 2, wherein the marinade further comprises a soluble seasoning.
12. The method according to claim 2, wherein the marinade further comprises an insoluble seasoning.
13. The method according to claim 2, wherein the predetermined amount of marinade is selected such that about 80% to about 99% (by weight) of the predetermined amount is absorbed by the meat substrate after 72 hours under refrigerated conditions.
14. The method according to claim 2, wherein the predetermined amount of marinade is selected such that about 85% to about 95% (by weight) of the predetermined amount is absorbed by the meat substrate after 72 hours under refrigerated conditions.
15. The method according to claim 2, wherein the meat substrate is a single cut of meat.
16. The method according to claim 2 further comprising cooking the meat substrate after sealing the package and while the meat substrate is still contained within the package.
17. The method according to claim 2 further comprising freezing the meat substrate after sealing the package and while the meat substrate is still contained within the package.
18. The method according to claim 2 further comprising, prior to placing the meat substrate in the package, at least one of macerating, scoring, or tenderizing the meat substrate.
19. The method according to claim 2, wherein the steps of placing, adding, and sealing are carried out as part of a continuous process.
20. The method of claim 2, wherein the thickening agent comprises a modified food starch and xanthan gum.
21. The method of claim 20, wherein the marinade comprises:
   - salt present in an amount of from about 76.0 to 81.0% by weight;
modified food starch present in an amount of from about 17.0 to 22.0% by weight;  
xanthan gum present in an amount of from about 0.5 to 3.5% by weight; and  
a predetermined amount of water.
22. The method of claim 21, wherein the marinade has a viscosity of about 100 cp when tested using a Brookfield viscometer operating at 50 rpm and a torque of 28% at about 36°F.
23. A method for continuously processing meat substrates, comprising the steps of:
placing a meat substrate in a package sized to contain the meat substrate and a predetermined amount of a marinade, wherein the marinade consists essentially of a solute, water a soluble seasoning and a thickening agent, and wherein the predetermined amount is selected to be substantially absorbed by the meat substrate;
adding the predetermined amount of the marinade to the package; and
sealing the package to allow the marinade to be substantially absorbed by the meat substrate while sealed.
24. A method for continuously processing meat substrates, comprising the steps of:
placing a fraction of a predetermined amount of a marinade in a package sized to contain the meat substrate and the predetermined amount of the marinade, to provide a partially-filled package, wherein the marinade has an insoluble seasoning dispersed therein and comprises a solute, a thickening agent and water, and wherein the predetermined amount is selected to be substantially absorbed by the meat substrate;
adding the meat substrate to the partially-filled package to provide a meat-containing package;
adding the remainder of the predetermined amount of the marinade to the meat-containing package; and
then sealing the package to allow the marinade to be substantially absorbed by the meat substrate while sealed.
25. The method of claim 24, wherein the marinade has a viscosity sufficient to provide substantially no leaking.
26. The method according to claim 24, wherein the meat substrate is a bone-in meat substrate or a boneless meat substrate.
27. The method according to claim 24, wherein the meat substrate is a portion selected from the group consisting of poultry, beef, pork, lamb, veal, and seafood.
28. The method according to claim 24, wherein the meat substrate is a portion of poultry.
29. The method according to claim 24, wherein the meat substrate is a portion of chicken.
30. The method according to claim 24, wherein the package comprises a film forming material and a cover film, and the step of sealing the package comprises applying a vacuum to the package while sealing the cover film with the film forming material such that the sealed package volume exceeds the sum of the volume of the meat and the volume of the predetermined amount of the marinade by about 0.1% to about 10%.
31. The method according to claim 24, wherein the package comprises a film forming material and a cover film, and the step of sealing the package comprises applying a vacuum to the package while sealing the cover film with the film forming material such that the sealed package volume is substantially equal to the sum of the volume of the meat and the volume of the predetermined amount of the marinade.
32. The method according to claim 24, wherein the marinade further comprises a soluble seasoning.
33. The method according to claim 24, wherein the predetermined amount of marinade is selected such that about 80% to about 99% (by weight) of the predetermined amount is absorbed by the meat substrate after 72 hours under refrigerated conditions.
34. The method according to claim 24, wherein the predetermined amount of marinade is selected such that about 85% to about 95% (by weight) of the predetermined amount is absorbed by the meat substrate after 72 hours under refrigerated conditions.
35. The method according to claim 24, wherein the meat substrate is a single cut of meat.
36. The method according to claim 24 further comprising cooking the meat substrate after sealing the package and while the meat substrate is still contained within the package.
37. The method according to claim 24 further comprising, prior to placing the meat substrate in the package, at least one of macerating, scoring, or tenderizing the meat substrate.
38. The method according to claim 24, wherein the steps of placing, adding the meat substrate, adding the remainder of the predetermined amount, and sealing are carried out as part of a continuous process.
39. A method for continuously processing meat substrates, comprising the steps of:
placing a fraction of a predetermined amount of a marinade in a flexible package sized to contain the meat substrate and the predetermined amount of the marinade, to provide a partially-filled package, wherein the marinade has an insoluble seasoning dispersed therein and consists essentially of a solute a thickening agent, water, and a soluble seasoning, and wherein the predetermined amount is selected to be substantially absorbed by the meat substrate;
adding the meat substrate to the partially-filled package to provide a meat-containing package;
adding the remainder of the predetermined amount of the marinade to the meat-containing package;
then sealing the package to allow the marinade to be substantially absorbed by the meat substrate while sealed.
40. The method of claim 39, wherein the marinade has a viscosity sufficient to provide substantially no leaking.
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