Claims

[Claim 1]

A method for producing an artificial three-dimensional muscular tissue, comprising steps of:

(i) disposing a first muscular tissue support, a second muscular tissue support, and muscle cells to constitute a three-dimensional muscular tissue precursor, wherein the muscle cells are disposed in a form of a line in gel with one end of the line close to the first muscular tissue support and another end of the line close to the second muscular tissue support, ~~and~~

(ii) dissolving or decomposing the gel, and

(iii) culturing the muscle cells of the three-dimensional muscular tissue precursor in a culture medium to obtain an artificial three-dimensional muscular tissue.

[Claim 2]

The method for producing according to claim 1, wherein the step (ii) further comprises removing the gel.

[Claim 3]

The method for producing according to claim 2, comprising steps of:

(i) disposing a first muscular tissue support, a second muscular tissue support, and muscle cells to constitute a three-dimensional muscular tissue precursor,

wherein the muscle cells are disposed in a form of a line in gel with one end of the line close to the first muscular tissue support and another end of the line close to the second muscular tissue support,

(ii) dissolving or decomposing, and removing the gel, and

(iii) culturing the muscle cells of the three-dimensional muscular tissue precursor in a culture medium to obtain an artificial three-dimensional muscular tissue,

wherein the step (i), the step (ii) and the step (iii) are performed in this order.

[Claim 4]

The method for producing according to claim 1, wherein additional culture medium is added before the step (iii).

[Claim 5]

The method for producing according to any one of claims 1 to 4, wherein the step (iii) comprises exchanging the culture medium.

[Claim 6]

The method for producing according to claim 1 characterized in producing an artificial three-dimensional muscular tissue having a fascicle of muscle fibers, wherein the step (i) comprises disposing muscle cells in a form of a plurality of lines in gel.

~~[Claim 2]~~

~~The method for producing an artificial three-dimensional muscular tissue according to claim 1, wherein the step (i) comprises disposing the first muscular tissue support and the second muscular tissue support, and then disposing the muscle cells in the form of a line with the one end of the line close to the first muscular tissue support and the other end of the line close to the second muscular tissue support, to constitute the three-dimensional muscular tissue precursor.~~

~~[Claim 3]~~

~~The method for producing an artificial three-dimensional muscular tissue according to claim 1, wherein the step (i) comprises disposing the muscle cells in the form of a line above the first muscular tissue support with the one end of the line close to the first muscular tissue support, and then disposing the second muscular tissue support with the other end of the line close to the second muscular tissue support, to constitute the three-dimensional muscular tissue precursor.~~

[Claim ~~4~~7]

The method for producing according to any one of claims 1 to ~~3~~6, wherein the muscle cells are disposed in a gel having thixotropy.

[Claim ~~5~~8]

The method for producing according to any one of claims 1 to ~~4~~7, wherein the muscle cells are disposed in the form of ~~a line~~ a plurality of lines by discharging using a multi-nozzle dispenser having multiple nozzles.

[Claim 9]

The method for producing according to any one of claims 1 to 8, further comprising gelating the first muscular tissue support and/or the second muscular tissue support.

[Claim 10]

The method for producing according to claim 9, wherein the first muscular tissue support and/or the second muscular tissue support are gelated after the step (i).

~~[Claim 6]~~

~~The method according to claim 5, wherein the line of the muscle cells disposed imitates muscle fibers of an animal.~~

[Claim ~~7~~11]

The method~~s~~ for producing according to any one of claims 1 to ~~6~~10, wherein the first muscular tissue support and/or the second muscular tissue support contains collagen.

[Claim 12]

The method for producing according to any one of claims 1 to 4, further comprising adding and assembling adipocytes and vascular cells based on the ratio between the fat tissue, vascular tissue, and muscular tissue of commercial beef.

[Claim 13]

The method for producing according to any one of claims 1 to 4, further comprising adding at least one of proteins, fats, carbohydrates, vitamins, minerals, fiber, fatty acids, amino acids, flavor materials, and coloring materials, for regulating at least one of the texture, nutritive values, the taste, and the color.

~~[Claim 8]~~

~~The method according to any one of claims 1 to 7, wherein the artificial three-dimensional muscular tissue is cultured with stretching tensile force applied to the artificial three-dimensional muscular tissue between the first muscular tissue support and the second muscular tissue support.~~

~~[Claim 9]~~

~~The method according to any one of claims 1 to 8, wherein the artificial three-dimensional muscular tissue is for medical care, drug evaluation, or food.~~

[Claim ~~10~~14]

An artificial three-dimensional muscular tissue having a fascicle of muscle fibers, comprising: a first muscular tissue support, a second muscular tissue support, and a muscular tissue, produced by the method for producing of any one of claims 1 to 13, wherein the muscular tissue is a plurality of linear, one end of the muscular tissue is connected to the first muscular tissue support, and another end of the muscular tissue is connected to the second muscular tissue support.

~~[Claim 11]~~

~~The artificial three-dimensional muscular tissue according to claim 10, wherein the artificial three-dimensional muscular tissue has a sarcomere structure.~~

[Claim ~~12~~15]

The artificial three-dimensional muscular tissue according to claim 14~~10 or 11~~, wherein the artificial three-dimensional muscular tissue is for medical care, drug evaluation, or food.