

PROCESS FOR PRODUCING FAT

Technical Field

5 The present invention relates to a process for producing a fat. In particular, it relates to a fat for frying wherein a heating odor and a thermal degradation order are improved as well as a fat for panfrying wherein lecithin odor is improved.

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Background Art

When a fat for frying is used for a long period of time, it is thermally decomposed to generate oxidized degradation products due to contact with oxygen at a high temperature which in turn emits a deterioration odor. In particular, liquid oils such as soybean oil and rapeseed oil contain much polyunsaturated acids as constituent fatty acids and thus are readily thermally oxidized. Fried products which produced by using a thermally oxidized fat for frying severely generate a deterioration odor caused by the odor of the fat. JP 4-66052 A discloses an attempt to improve the odor of a fat by means of interesterification; however, this does not reduce an heating odor and substantially simply decreases peculiar odors of palm oil and hydrogenated fats. Furthermore, JP 7-135972 A

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discloses decomposition of lipid peroxides to delay thermal deterioration, thereby trying to improve taste of fats.

However, there is no description about a heating odor generated by heating and about the improvement of the

5 environment of a kitchen. Thus, the prior art is not sufficient to effectively reduce a heating odor. Thus, an effective means is not available on the improvement of degradation of fried products. Then, an oil for frying that emits a degradation odor must be only replaced by a
10 new oil even though its acid value is low.

It is generally recognized that ascorbic acid is excellent in resistance to oxidation as a synergist.

Regarding ascorbic acid, "New Food Industry," Vol. 27, No. 11 (1985) p.68 describes as follows. That is, "Ascorbic

15 acid, as described above, is not suitable for preventing the oxidation of frying oils such as liquid vegetable oils taking into account the facts that it has a poor oil solubility, it is liable to undergo thermal decomposition, and its chelate effect on metals is hardly expected. In
20 addition, it should be noted that ascorbic acid acts as an oxidation accelerating agent in some cases."

As described above, it has been recognized that it is difficult to incorporate ascorbic acid into a fat. As a result, ascorbic acid has been improved to be oil-soluble
25 by converting it into ascorbyl palmitate, which has been

used as an anti-oxidizing agent for fats. Then, ascorbic acid itself has never been used as an anti-oxidizing agent for a frying oil.

- Furthermore, while a fat for panfrying is used for
5 improving a flavor and mouthfeel as well as preventing
scorching during panfrying of foods, salad oil itself does
not have sufficient release property and only a lecithin is
specifically effective. However, a lecithin has a specific
10 flavor and adversely affects on the taste of a product due
to strong taste generated during heating, and therefore the
amount of a lecithin to be use is limited. In order to
improve this, although it is proposed to subject a lecithin
to enzyme treatment, high-purification, fractionation or
the like, any of them greatly increases the cost in
15 comparison with a crude lecithin.

Disclosure of the Invention

The objects of the present invention are to facilitate
incorporation of a slightly fat soluble organic acid such
20 as ascorbic acid into in a fat and to improve the odor
generated by heating of a fat for frying, and to provide a
fat for frying in which the deterioration odor by heating
of fried products is improved as well as a fat for
panfrying wherein the lecithin odor is improved.

25 The present inventors have studied intensively in

order to solve the above problems. As a result, the present inventors have succeeded in incorporation of at least one organic acid selected from ascorbic acid, erysorbic acid and malic acid in a fat by adding the organic acid in the form of an aqueous solution to a fat and then subjecting the mixture to dehydration treatment at a high temperature and a highly reduced pressure. Ascorbic acid is easily thermally decomposed and thus easily oxidized and thermally decomposed in water. However, it has been found that ascorbic acid can unexpectedly be stable in a fat, i.e., a non-aqueous system. That is, ascorbic acid has been proved to be usable as an anti-oxidizing agent for fats specifically for cooking oil. Conventional anti-oxidizing agents simply suppress the increase of an acid value and an peroxide value and no effective ant-oxidizing agents is present for suppressing degradation odors by heating of fats. The present inventors have found that a fat containing at least one organic acid selected from ascorbic acid, erysorbic acid and malic acid therein can specifically suppress a degradation odor by heating of a fat. In addition, it has been found that, when ascorbic acid is added to a fat and further crude lecithin is added thereto, the peculiar taste of the crude lecithin is hardly recognized. Thus, the present invention has been completed.

That is, the present invention is a process for producing a fat characterized in that at least one organic acid selected from ascorbic acid, erysorbic acid and malic acid in the form of an aqueous solution is added to a fat and then the resulting mixture is treated by dehydration at 50 to 180°C under a reduced pressure of 0.5 to 100 Torr; and a fat for frying obtained by the process; as well as a process for producing a fat wherein a lecithin is further added to the fat; and a fat for panfrying obtained by the process.

Best Mode for Carrying Out the Invention

The organic acids used in the present invention is preferably ascorbic acid, erysorbic acid and malic acid. These organic acids may be those generally used in foods and pharmaceuticals and may be used alone or in combination with two or more thereof. Preferably, the organic acids are added to a fat so that they are contained in the fat in an amount of 2 to 28 ppm. When the amount of organic acids is below 2 ppm, the desired effect is hardly expected and, when the amount of the organic acids to be added exceeds 28 ppm, crystals of the organic acids are precipitated, and thus it is difficult to incorporate the organic acids into the fat.

Examples of the fat used in the present invention

include vegetable oils such as soybean oil, rapeseed oil, corn oil, cotton seed oil, peanut oil, sunflower oil, rice oil, saffron oil, safflower oil, olive oil, sesame oil, palm oil, coconut oil, palm kernel oil, etc.; animal fats such as beef tallow, lard, etc.; and processed fats obtained by subjecting these fats to fractionation, hydrogenation, interesterification, etc. These may be used alone or in combination thereof. In particular, soybean oil or rapeseed oil is greatly effective in suppressing the degradation odor.

The process for producing a fat comprising the organic acid(s) of the present invention can be carried out, for example, by, in case of obtaining a fat containing ascorbic acid, adding a given amount of an aqueous 1% ascorbic acid solution to a fat heated to 70°C and treating the mixture for 15 minutes to 1 hour while stirring under conditions at 50 to 180°C under reduced pressure of 0.5 to 100 Torr to thoroughly dehydrate the mixture to obtain a fat comprising ascorbic acid. The concentration of ascorbic acid is from 0.1 to 22%, preferably 1 to 10%. When the concentration is less than the lower limit, inferior efficiency is resulted due to a large amount of water relative to a fat. When the concentration exceeds the upper limit, crystals of ascorbic acid are precipitated, which results in difficulty of incorporation into the fat. The process can be carried out

at a temperature of 50 to 180°C. When the temperature is below the lower limit, inferior efficiency is resulted because dehydration requires long time. In addition, when the-temperature exceeds the upper limit, ascorbic acid is decomposed, which results in poor effect. The reduced pressure condition is from 0.5 to 100 Torr and preferably as low as possible.

Improvement in reduction of an odor by heating of a fat comprising at least one organic acid selected from ascorbic acid, erysorbic acid and malic acid is enhanced by combination with another anti-oxidizing agent such as extracted tocopherol, palmitate ascorbate, or catechin. This anti-oxidizing agent can be easily incorporated into a fat by simply adding to the fat. That is, preferably, a fat contains 2 to 28 ppm of the organic acid(s) and 10 to 2000 ppm of one or more materials selected from extracted tocopherol, palmitate ascorbate, and catechin.

The fat obtained by the process of the present invention is suitably used for a frying fat which contact frequently with oxygen at a high temperature. It is presumed that the reason why the organic acid(s) in a trace amount of 2 to 28 ppm can improve an odor by heating of a fat for frying and a degradation odor by heating of a fried product would be that the organic acid(s) are dissolved and dispersed uniformly in the fat and thus enhances the

efficiency of the anti-oxidizing effect.

In addition, a fat in which crude lecithin is further added to the fat described above, particularly the fat prepared by adding ascorbic acid to a fat provides such an effect that the peculiar odor of crude lecithin is hardly recognized, and therefore has excellent oxidation stability due to the addition of the organic acid(s) and also are suitable for use as a fat for panfrying that is free from scorching and has excellent release properties.

The lecithin may include that treated with an enzyme, treated by hydrogenation or treated by fractionation, and in particular the use of crude lecithin is advantageous in cost efficiency. A suitable amount of the lecithin to be added is 0.05 to 5% by weight, preferably 0.2 to 3% by weight in terms of phosphoric lipid based on the amount of fat. According to the present invention, another emulsifying agent in addition to the lecithin can be used in combination.

Examples

The following Examples further illustrate the present invention in more detail, but are not to be construed to limit the spirit of the present invention. In the following Examples, %'s and parts are by weight.

The ascorbic acid determination method, the fry test

method and the taste evaluating method were carried out in the following manners.

(Ascorbic acid determination method)

A fat is placed in a test tube which can be sealed,
5 and an aqueous 5% metaphosphoric acid solution whose amount is equal to the fat, and hexane whose amount is twice as much as the amount of the fat are added thereto, and then the mixture is agitated by shaking. After allowing to stand, absorbancy of the aqueous phase portion is
10 determined at 246 nm. Separately, absorbancy of a known amount of an aqueous ascorbic acid solution is determined at 246 nm to prepare a calibration curve for using the determination of samples of unknown concentrations.

(Fry test method)

15 In a frying pan is placed 2 kg of a fat for frying. The oil temperature is kept at $180 \pm 5^{\circ}\text{C}$. A frozen croquette is put in the oil every 20 minutes and fried for 4 minutes. This operation is repeated continuously for 18 hours and the taste of croquettes after 18 hours is
20 evaluated.

(Taste evaluating method)

Each sample is subjected to evaluations of taste panelists according to the following criteria.

5 points: deterioration odor is not recognized at all.

25 4 points: deterioration odor is suppressed and good.

3 points: deterioration odor is suppressed, but is recognized slightly.

2 points: deterioration odor is strong.

1 point: deterioration odor is very strong.

5 The scores for each sample are totaled and are divided by the number of panelists (n) to calculate the average. The average score is used for overall evaluation according to the following criteria.

◎: $4 < \text{average score} \leq 5$,

10 ○: $3 < \text{average score} \leq 4$,

△: $2 < \text{average score} \leq 3$,

X: average score ≤ 2

 The anti-oxidizing agents below were used in the following Examples and Comparative Examples.

15 Ascorbic acid (manufactured by Wako Pure Chemicals Industries, Ltd., trade name: L-ascorbic acid, purity: 99.5%)

 Eryorbic acid (manufactured by Wako Pure Chemicals Industries, Ltd., trade name: Eryorbic acid, purity: 20 97.0%)

 Malic acid (manufactured by Wako Pure Chemicals Industries, Ltd., trade name: Malic acid, purity: 97.0%)

 Extracted tocopherol (manufactured by Riken Vitamin Co. Ltd., trade name: E Oil 805D, extracted tocopherol 70%, 25 vegetable fat 30%)

Ascorbyl Palmitate (manufactured by Riken Vitamin Co. Ltd., trade name: EC-100, ascorbyl palmitat 10%, extracted tocopherol 10%, glyceryl fatty ester 51%, food material 29%)

- 5 Catechin (manufactured by Taiyo Kagaku Co., Ltd., trade name: Sunkatol, catechin 10%, extracted tocopherol 9%, glyceryl fatty ester 64%, food material 17%)

Crude lecithin (manufactured by Turu Lecithin MFG Co., Ltd., lecithin SLP paste (phosphoric lipid 60% to 65%))

- 10 High purity lecithin (manufactured by Turu Lecithin MFG Co., Ltd., lecithin SLP white (phosphoric lipid 95% or more))

Example 1

- To 100 parts by weight of soybean oil heated to 70°C was added 0.2 part by weight of an aqueous 1% ascorbic acid solution and the resulting mixture was subjected to dehydration treatment with stirring at 70°C for 20 minutes under a reduced pressure of 40 Torr. Then, the mixture was filtered through a TOYO No.5 C filter paper (corresponding to 1 μ m) to obtain a fat containing ascorbic acid.
- 15 According to the ascorbic acid determination method, the ascorbic acid concentration was 10.4 ppm. This fat was subjected to the fry test. The fried croquette products were evaluated for taste, with the evaluation average score being 4.2 and the taste being good.

- 25 Example 2

To 100 parts by weight of soybean oil heated to 70°C was added 0.03 part by weight of an aqueous 1% ascorbic acid solution and the resulting mixture was subjected to dehydration treatment with stirring at 70°C for 20 minutes under a reduced pressure of 40 Torr. Then, the mixture was filtered through a TOYO No.5 C filter paper (corresponding to 1 μ m) to obtain a fat containing ascorbic acid.

According to the ascorbic acid determination method, the ascorbic acid concentration was 2.9 ppm. This fat was subjected to fry test. The fried croquette products were evaluated for taste, with the evaluation average score being 3.1 and the taste being good.

Example 3

To 100 parts by weight of soybean oil heated to 70°C was added 0.1 part by weight of an aqueous 1% ascorbic acid solution and the resulting mixture was subjected to dehydration treatment with stirring at 70°C for 20 minutes under a reduced pressure of 40 Torr with stirring. Then, the mixture was filtered through a TOYO No.5 C filter paper (corresponding to 1 μ m) to obtain a fat containing ascorbic acid. According to the ascorbic acid determination method, the ascorbic acid concentration was 7.6 ppm. This fat was subjected to fry test. The fried croquette products were evaluated for taste, with the evaluation average score being 3.4 and the taste being good.

Example 4

To 100 parts by weight of soybean oil heated to 70°C was added 0.25 part by weight of an aqueous 1% ascorbic acid solution and the resulting mixture was subjected to dehydration treatment with stirring at 70°C for 20 minutes under a reduced pressure of 40 Torr. Then, the mixture was filtered through a TOYO No.5 C filter paper (corresponding to 1 μ m) to obtain a fat containing ascorbic acid.

According to the ascorbic acid determination method, the ascorbic acid concentration was 14.5 ppm. This fat was subjected to fry test. The fried croquette products were evaluated for taste, with the evaluation average score being 4.3 and the taste being good.

The taste evaluations of the fats for frying of

Examples 1 to 4 are summarized in Table 1.

Table 1

	Example 1	Example 2	Example 3	Example 4
Soybean oil	100 parts	100 parts	100 parts	100 parts
Ascorbic acid	10.4 ppm	2.9 ppm	7.6 ppm	14.5 ppm
Evaluation average score	4.2	3.1	3.4	4.3
Overall evaluation	◎	○	○	◎

Comparative Example 1

Fry testing similar to that of Example 1 was carried out on 100 parts by weight of soybean oil only without

addition of any other materials. The croquettes of the fried products were evaluated for taste, with the evaluation average score being 1.2 and degradation odor for taste being very strong.

5 Comparative Example 2

To 100 parts by weight of soybean oil was added 0.1 part by weight of extracted tocopherol (manufactured by Riken Vitamin Co., Ltd., trade name: E Oil 805D) to prepare a fat containing extracted tocopherol. The fat was
10 subjected to fry test. The croquettes of the fried products were evaluated for taste, with the evaluation average score being 1.3 and degradation odor for taste being very strong.

Comparative Example 3

15 To 100 parts by weight of soybean oil was added 0.1 part by weight of ascorbyl palmitate/extracted tocopherol (manufactured by Riken Vitamin Co., Ltd., trade name: EC-100) to prepare a fat containing ascorbyl
20 palmitate/extracted tocopherol. The fat was subjected to fry test. The croquettes of the fried products were evaluated for taste, with the evaluation average score being 1.3 and degradation odor for taste being very strong.

Comparative Example 4

To 100 parts by weight of soybean oil was added 0.1
25 part by weight of catechin/extracted tocopherol

(manufactured by Taiyo Kagaku Co., Ltd., trade name: Sunkatol) to prepare a fat containing catechin/extracted tocopherol. The fat was subjected to fry test. The croquettes of the fried products were evaluated for taste, with the evaluation average score being 1.5 and degradation odor for taste being very strong.

The taste evaluations of the fats for frying of Comparative Examples 1 to 4 are summarized in Table 2.

Table 2

	Comparative Example 1	Comparative Example 2	Comparative Example 3	Comparative Example 4
Soybean oil	100 parts	100 parts	100 parts	100 parts
Extracted tocopherol	-	700 ppm	100 ppm	90 ppm
Ascorbyl palmitate	-	-	100 ppm	-
Catechin	-	-	-	100 ppm
Evaluation average score	1.2	1.3	1.3	1.5
Overall evaluation	x	x	x	x

Example 5

To 100 parts by weight of soybean oil heated to 70°C was added 0.1 part by weight of an aqueous 1% ascorbic acid solution and the resulting mixture was subjected to dehydration treatment with stirring at 70°C for 20 minutes under a reduced pressure of 40 Torr. Then, the mixture was filtered through a TOYO No.5 C filter paper (corresponding to 1 μ m) to obtain a fat containing ascorbic acid. To this fat was further added 0.015 part by weight of ascorbic

acid/extracted tocopherol (manufactured by Riken Vitamin Co., Ltd., trade name: E Oil 805D) to prepare a fat containing ascorbic acid/extracted tocopherol. This fat was subjected to fry test. The fried croquette products were evaluated for taste, with the evaluation average score being 3.6 and the taste being good.

Example 6

To 100 parts by weight of soybean oil heated to 70°C was added 0.1 part by weight of an aqueous 1% ascorbic acid solution and the resulting mixture was subjected to dehydration treatment with stirring at 70°C for 20 minutes under a reduced pressure of 40 Torr. Then, the mixture was filtered through a TOYO No.5 C filter paper (corresponding to 1 μ m) to obtain a fat containing ascorbic acid. To this fat was further added 0.15 part by weight of ascorbic acid/extracted tocopherol (manufactured by Riken Vitamin Co., Ltd., trade name: E Oil 805D) to prepare a fat containing ascorbic acid/extracted tocopherol. This fat was subjected to fry test. The fried croquette products were evaluated for taste, with the evaluation average score being 4.7 and the taste being good.

Example 7

To 100 parts by weight of soybean oil heated to 70°C was added 0.1 part by weight of an aqueous 1% ascorbic acid solution and the resulting mixture was subjected to

dehydration treatment with stirring at 70°C for 20 minutes under a reduced pressure of 40 Torr. Then, the mixture was filtered through a TOYO No.5 C filter paper (corresponding to 1 μ m) to obtain a fat containing ascorbic acid. To this fat was further added 0.015 part by weight of ascorbic acid/ascorbyl palmitate/extracted tocopherol (manufactured by Riken Vitamin Co., Ltd., trade name: EC-100) to prepare a fat containing ascorbic acid/ascorbyl palmitate/extracted tocopherol. This fat was subjected to fry test. The fried croquette products were evaluated for taste, with the evaluation average score being 3.7 and the taste being good.

Example 8

To 100 parts by weight of soybean oil heated to 70°C was added 0.1 part by weight of an aqueous 1% ascorbic acid aqueous solution and the resulting mixture was subjected to dehydration treatment with stirring at 70°C for 20 minutes under a reduced pressure of 40 Torr. Then, the mixture was filtered through a TOYO No.5 C filter paper (corresponding to 1 μ m) to obtain a fat containing ascorbic acid. To this fat was further added 0.15 part by weight of ascorbic acid/ascorbyl palmitate/extracted tocopherol (manufactured by Riken Vitamin Co., Ltd., trade name: EC-100) to prepare a fat containing ascorbic acid/ascorbyl palmitate/extracted tocopherol. This fat was subjected to fry test. The fried croquette products were evaluated for taste, with the

evaluation average score being 4.4 and the taste being good.

Example 9

To 100 parts by weight of soybean oil heated to 70°C was added 0.1 part by weight of an aqueous 1% ascorbic acid solution and the resulting mixture was subjected to dehydration treatment with stirring at 70°C for 20 minutes under a reduced pressure of 40 Torr. Then, the mixture was filtered through a TOYO No.5 C filter paper (corresponding to 1 μ m) to obtain a fat containing ascorbic acid. To this fat was further added 0.015 part by weight of ascorbic acid/catechin/extracted tocopherol (manufactured by Taiyo Kagaku Co., Ltd., trade name: Sunkatol) to prepare a fat containing ascorbic acid/catechin/extracted tocopherol. This fat was subjected to fry test. The fried croquette products were evaluated for taste, with the evaluation average score being 3.8 and the taste being good.

Example 10

To 100 parts by weight of soybean oil heated to 70°C was added 0.1 part by weight of an aqueous 1% ascorbic acid solution and the resulting mixture was subjected to dehydration treatment with stirring at 70°C for 20 minutes under a reduced pressure of 40 Torr. Then, the mixture was filtered through a TOYO No.5 C filter paper (corresponding to 1 μ m) to obtain a fat containing ascorbic acid. To this fat was further added 0.15 part by weight of ascorbic

acid/catechin/extracted tocopherol (manufactured by Taiyo Kagaku Co., Ltd., trade name: Sunkatol) to prepare a fat containing ascorbic acid/catechin/extracted tocopherol.

This fat was subjected to fry test. The fried croquette products were evaluated for taste, with the evaluation average score being 4.2 and the taste being good.

The taste evaluations of the fats for frying in Examples 5 to 10 are summarized in Table 3.

Table 3

	Example 5	Example 6	Example 7
Soybean oil	100 parts	100 parts	100 parts
Ascorbic acid	7.4 ppm	7.3 ppm	7.7 ppm
Extracted tocopherol	105 ppm	1050 ppm	15 ppm
Ascorbyl palmitate	-	-	15 ppm
Catechin	-	-	-
Evaluation average	3.6	4.7	3.7
Overall evaluation	O	◎	O

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	Example 8	Example 9	Example 10
Soybean oil	100 parts	100 parts	100 parts
Ascorbic acid	7.4 ppm	7.5 ppm	7.6 ppm
Extracted tocopherol	150 ppm	14 ppm	135 ppm
Ascorbyl palmitate	150 ppm	-	-
Catechin	-	15 ppm	150 ppm
Evaluation average	4.4	3.8	4.2
Overall evaluation	◎	O	◎

Example 11

To 100 parts by weight of soybean oil heated to 70°C was added 0.2 part by weight of an aqueous 1% erysorbic

acid solution and the resulting mixture was subjected to dehydration treatment with stirring at 70°C for 20 minutes under a reduced pressure of 40 Torr. Then, the mixture was filtered through a TOYO No.5 C filter paper (corresponding to 1 μ m) to obtain a fat containing erysorbic acid. To this fat was further added 0.1 part by weight of erysorbic acid/extracted tocopherol (manufactured by Riken Vitamin Co., Ltd., trade name: E Oil 805D) to prepare a fat containing erysorbic acid/extracted tocopherol. This fat was subjected to fry test. The fried croquette products were evaluated for taste, with the evaluation average score being 3.1 and the taste being good.

Example 12

To 100 parts by weight of soybean oil heated to 70°C was added 0.2 part by weight of an aqueous 1% malic acid solution and the resulting mixture was subjected to dehydration treatment with stirring at 70°C for 20 minutes under a reduced pressure of 40 Torr. Then, the mixture was filtered through a TOYO No.5 C filter paper (corresponding to 1 μ m) to obtain a fat containing malic acid. To this fat was further added 0.1 part by weight of malic acid/extracted tocopherol (manufactured by Riken Vitamin Co., Ltd., trade name: E Oil 805D) to prepare a fat containing malic acid/extracted tocopherol. This fat was subjected to fry test. The fried croquette products were

evaluated for taste, with the evaluation average score being 3.2 and the taste being good.

Example 13

To 100 parts by weight of rapeseed oil heated to 70°C
5 was added 0.1 part by weight of an aqueous 1% ascorbic acid
solution and the resulting mixture was subjected to
dehydration treatment with stirring at 70°C for 20 minutes
under a reduced pressure of 40 Torr. Then, the mixture was
filtered through a TOYO No.5 C filter paper (corresponding
10 to 1 µm) to obtain a fat containing ascorbic acid. To this
fat was further added 0.015 part by weight of ascorbic
acid/extracted tocopherol (manufactured by Riken Vitamin
Co., Ltd., trade name: E Oil 805D) to prepare a fat
containing ascorbic acid/extracted tocopherol. This fat
15 was subjected to fry test. The fried croquette products
were evaluated for taste, with the evaluation average score
being 3.4 and the taste being good.

Example 14

To 100 parts by weight of rapeseed oil heated to 70°C
20 was added 0.1 part by weight of an aqueous 1% ascorbic acid
solution and the resulting mixture was subjected to
dehydration treatment with stirring at 70°C for 20 minutes
under a reduced pressure of 40 Torr. Then, the mixture was
filtered through a TOYO No.5 C filter paper (corresponding
25 to 1 µm) to obtain a fat containing ascorbic acid. To this

fat was further added 0.15 part by weight of ascorbic acid/extracted tocopherol (manufactured by Riken Vitamin Co., Ltd., trade name: E Oil 805D) to prepare a fat containing ascorbic acid/extracted tocopherol. This fat was subjected to fry test. The fried croquette products were evaluated for taste, with the evaluation average score being 4.7 and the taste being good.

Comparative Example 5

Frying test similar to that of Example 1 was carried out on 100 parts by weight of rapeseed oil only without addition of any other materials. The croquettes of the fried products were evaluated for taste, with the evaluation average score being 1.2 and degradation odor for taste being very strong.

The taste evaluations of the fats for frying in Examples 11 to 14 are summarized in Table 4.

Table 4

	Example 11	Example 12	Example 13
Soybean oil	100 parts	100 parts	-
Rapeseed oil	-	-	100 parts
Ascorbic acid	-	-	7.7 ppm
Erythorbic acid	10.4 ppm	-	-
Malic acid	-	13.3 ppm	-
Extracted tocopherol	700 ppm	700 ppm	105 ppm
Evaluation average	3.2	3.3	3.4
Overall evaluation	O	O◎	O

	Example 14	Comparative Example 5
Soybean oil	-	100 parts
Rapeseed oil	100 parts	100 parts
Ascorbic acid	7.6 ppm	-
Erythorbic acid	-	-
Malic acid	-	-
Extracted tocopherol	1050 ppm	-
Evaluation average score	4.7	1.2
Overall evaluation	◎	x

Fat for panfrying (Examples 15 to 17, Comparative Examples 6 to 9)

- 5 In an iron fry pan, 5 g of a testing fat was placed and heated using an electromagnetic heating device. Into the pan, 40 g of beaten egg was poured to make thin fried egg. This was repeated and how many pieces of thin fried egg can be continuously made without scorching was compared.
- 10 At the same time, the taste evaluation during fat heating was conducted.

The contents of testing fats are shown in Table 5 and fats containing ascorbic acid were obtained by the methods described in Examples 1 and 2. The presence and absence of

15 ascorbic acid and lecithin were studied.

Taste evaluation: ◎: with no lecithin odor, O: with almost no lecithin odor, Δ: with lecithin odor, x: with strong lecithin odor

The results of Examples 15 to 17 and Comparative Examples 6 to 9 are summarized in Table 5.

Table 5

	Example 15	Example 16	Example 17
Crude lecithin	1 part	3 parts	3 parts
High purity lecithin	0	0	0
A acid	10.4 ppm	10.4 ppm	2.9 ppm
Lecithin odor	◎	◎	0
Number of pieces of fried egg	28	61	58

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	Comparative Example 6	Comparative Example 7	Comparative Example 8	Comparative Example 9
Crude lecithin	0	1 part	0	3 parts
High purity lecithin	0	0	1 part	0
A acid	0	0	0	0
Lecithin odor	◎	×	Δ	×
Number of pieces of fried egg	18	24	27	57

51.

A acid: ascorbic acid

As a result, when the amount of lecithin to be added is increased, the release effect is improved, but a lecithin odor tends to become strong and thus the taste tends to be deteriorated (Comparative Examples 6 to 9). On the other hand, for the fried egg having ascorbic acid added thereto, the taste is not deteriorated even though lecithin is added (Examples 15 to 17).

• Fat for panfrying (Examples 18 to 20, Comparative Examples 10 to 13)

Panfrying test was carried out using fats similar to those used in Examples 15 to 17 and Comparative Examples 6 to 9.

In an iron fry pan, 7.5 g of a testing fat was placed and heated using an electromagnetic heating device and then to this was added 250 g of cooked rice and fried for 3 minutes.

10 Evaluation of loosening of rice mass: ◎: excellent, O: good, Δ: slightly poor, *: poor

The results of Examples 18 to 20 and Comparative Examples 10 to 13 are summarized in Table 6.

Table 6

	Example 18	Example 19	Example 20
Crude lecithin	1 part	3 parts	3 parts
High purity lecithin	0	0	0
A acid	10.4 ppm	10.4 ppm	2.9 ppm
Lecithin odor	◎	◎	O
Rice mass loosening	Δ	◎	◎
Mouthfeel	Slightly sticky	Good with crispiness	Good with crispiness

	Comparative Example 10	Comparative Example 11	Comparative Example 12	Comparative Example 13
Crude lecithin	0	1 part	0	3 parts
High purity lecithin	0	0	1 part	0
A acid	0	0	0	0
Lecithin odor	⊙	x	Δ	x
Rice mass loosening	x	Δ	0	⊙
Mouthfeel	Sticky	Slightly sticky	Slightly sticky	Good with crispiness

As a result, for each Comparative Example, the taste is poor or the eating feel for fried rice is poor, while
5 with each Example both taste and mouthfeel are good.

Industrial Applicability

According to the present invention, it is possible to provide, by improving the odor generated by heating a fat
10 for frying, a fat for frying in which the deterioration odor of a fried product is improved, as well as a fat for panfrying which is free from scorching and has excellent release properties and a pleasant flavor.

CLAIMS

1. (Amended) A process for producing a fat characterized in that at least one organic acid selected
5 from ascorbic acid, erysorbic acid and malic acid in the form of an aqueous solution is added to a fat and then the resulting mixture is treated by dehydration at 50 to 180°C under a reduced pressure of 0.5 to 100 Torr so that the acid is contained in an amount of 2 to 28 ppm in the fat.

10 2. (Deleted)

3. (Amended) The process according to claim 1, wherein one or two or more materials selected from extracted tocopherol, palmitate ascorbate and catechin are further added so that the materials are contained in an
15 amount of 10 to 2,000 ppm in the fat.

4. (Amended) The process according to claim 1 or 3, wherein a lecithin is further added.

5. (Amended) The process according to claim 4, wherein ascorbic acid and lecithin are used in combination.

20 6. (Amended) A fat for frying obtained by the process according to claim 1 or 3.

7. (Amended) A fat for panfrying obtained by the process according to claim 4 or 5.