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Research work on a theme:



**«Reception of potato starch
in house conditions»**

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1. Introduction

The urgency of the given work

Starch is widely used in the industry and in a life. Being in village, not always there is a possibility to buy starch in shop and the decision of the given problem would be to have possibility to receive it in house conditions.

The purpose of the given work

To learn that is such starch, where it is applied, technology of getting starch in industrial conditions and to try to receive starch in house conditions.

Hypothesis

And whether it is possible to receive starch in house conditions?



Problems

Following
problems
have been
defined:

1

to learn that is such starch;

2

where and for what starch is used;

3

to find technology of getting starch in industrial conditions;

4

to find, if it is possible, technology of getting starch in house conditions;

5

to make the list of the equipment and the stock necessary for reception of starch in house conditions, and to get it;

6

to spend process of getting starch in house conditions according to technology and to be convinced of positive result.



2. The literary review

2.1. What is the starch



Starch is one of photosynthesis products. It is widespread in the nature. For plants it is a stock of nutrients. Starch contains basically in fruits, seeds and tubers.

Starch on a chemical compound and a structure concerns difficult carbohydrates.

Starch is necessary for a human body as an energy source.



2.2. Starched grains

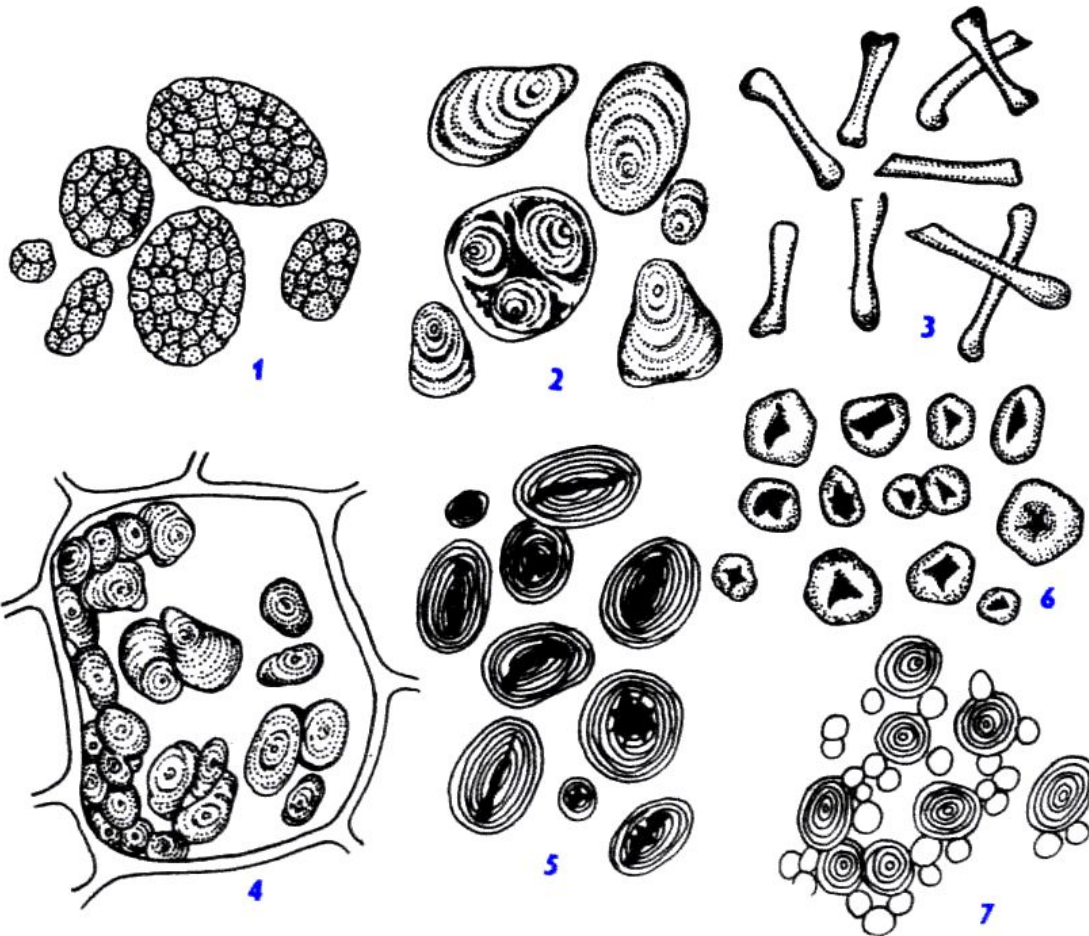


Starch is in cells of plants in the form of dense formations. They have received the name of starched grains. The form of starched grains can be various.

For example, grains of potato starch the ovate-orbicular. Grains of corn starch many-sided and they more small, than potato. Grains of wheaten starch of the round or elliptic form of the average sizes. Rice starch consists of the fine grains of the many-sided form assembled in chains, clusters, etc.



Different types of starched grains



- 1 – of oats ,
- 2 – of potato,
- 3 – of spurge ,
- 4 – of geranium,
- 5 – of bean ,
- 6 – of corn ,
- 7 – of wheaten.



2.3. Properties of starch



Starch is an insipid, amorphous powder of white color.

In cold water starch is almost insoluble. In hot water at temperature nearby 65°C starch is dissolved, flour paste.

At the high amount, quantity of starch in paste student not forming ability of starch is shown.



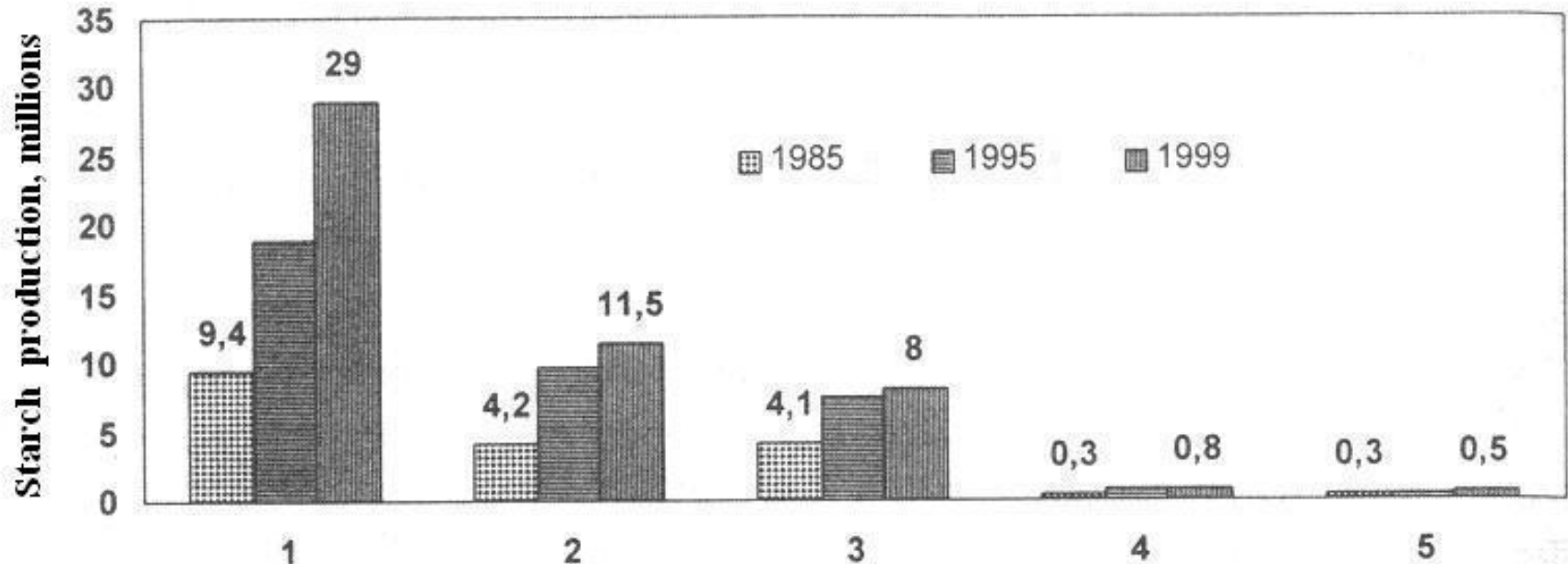
Iodic reaction



Starch is easily found out by iodic reaction. If on a cut of a tuber of a potato to drip iodine, starch is painted in dark blue color.



2.4. Tendencies of development of world production of starch



1 - North America; 2 - South-East Asia; 3 - European Union; 4 - South Africa; 5 - others

Manufacture of starch and starched products continuously increases in the world. It is connected with sharp increase of manufacture of sugary products from starch and with the organization of manufacture of biodegraded polymeric materials on its basis.

As a rule, local kinds of containing starch raw materials are used for processing in starch in the various countries.

➔ 2.5. Application of starch and its derivatives (a dextrin, treacle, glucose)

2.5.1. Application in the food-processing industry

Most widely starch and its derivatives are applied in the food-processing industry.

Starch is used in the food-processing industry as a thickener and the stabilizer for manufacture of sauces, dairy puddings, yogurts, mayonnaise, ketchups, creams, for ice-cream preparation.

Starch is used in manufacture of ethyl spirit of food and medical appointment.





Application of starch and its derivatives

Application in the food-processing industry

Starch add to wheat flour at a batch of bakeries and confectionery for giving of softness and tenderness to a product.

Addition of a small amount of starch to mincemeat does boiled sausages and sausages juicy.





Application of starch and its derivatives

2.5.2. Application in medicine

In medicine starch is applied as a filler by manufacture of tablets, as a basis to getting blood substitute.

Glucose is an irreplaceable and widespread medical preparation.



2.5.3. Application in the textile industry

In the textile industry starch apply for improvement of a basis of a fabric, for rigidity paints, for furnish of fabrics.



Application of starch and its derivatives

2.5.4. Application in the paper industry

In the paper industry starch is used for manufacture of the glue used for pasting of sheets of a corrugated cardboard.



2.5.5. Application in building

Thickeners on the basis of corn starch are applied to manufacture of building mixes.





Application of starch and its derivatives

2.5.6. Application in other industries

Starch is applied to preparation of forming mixes in foundry manufacture.



Starch is annually renewed biodegradable material. Therefore in a number of the countries it is widely used for manufacture of packing materials and ware of one using.





Application of starch and its derivatives

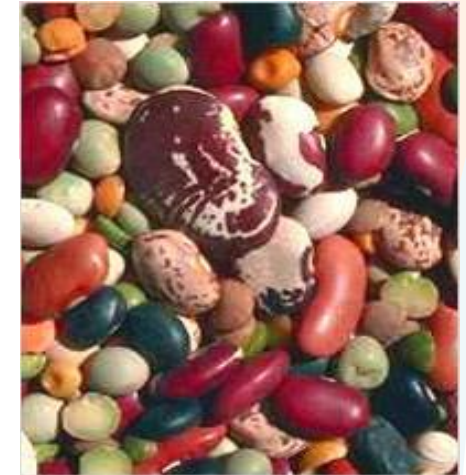
2.5.7. Starch application in a life

Starch is used by the population for personal consumption: at preparation of kissels and sauces, starching linen, preparation of glue for wall-paper.





2.6. Raw materials for starch reception



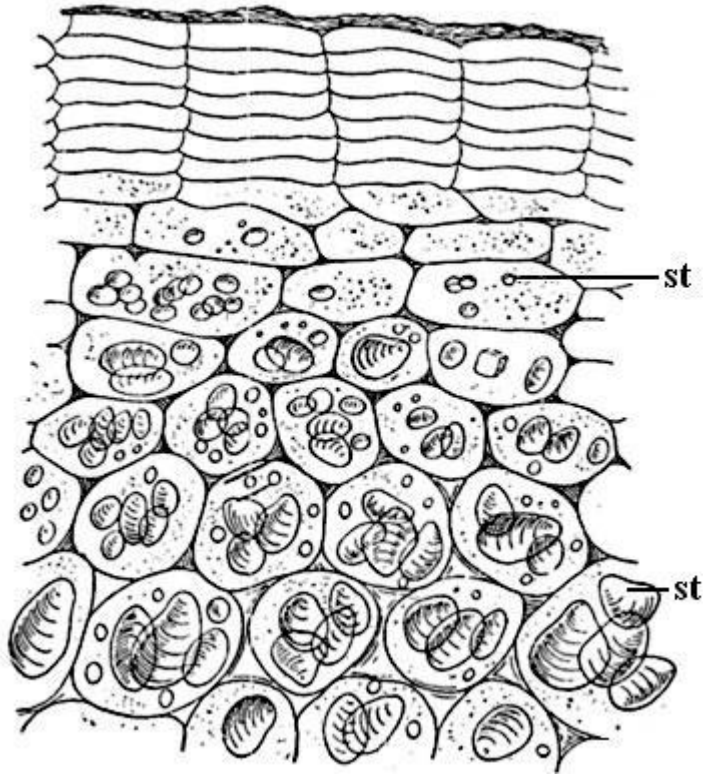
In considerable quantities starch contains in grain crops, tubers of vegetable cultures, seeds of bean.

In industry it basically receive from a potato, corn, it is less – from rice and wheat.

Later I will tell about potato starch.



2.2. Potato starch

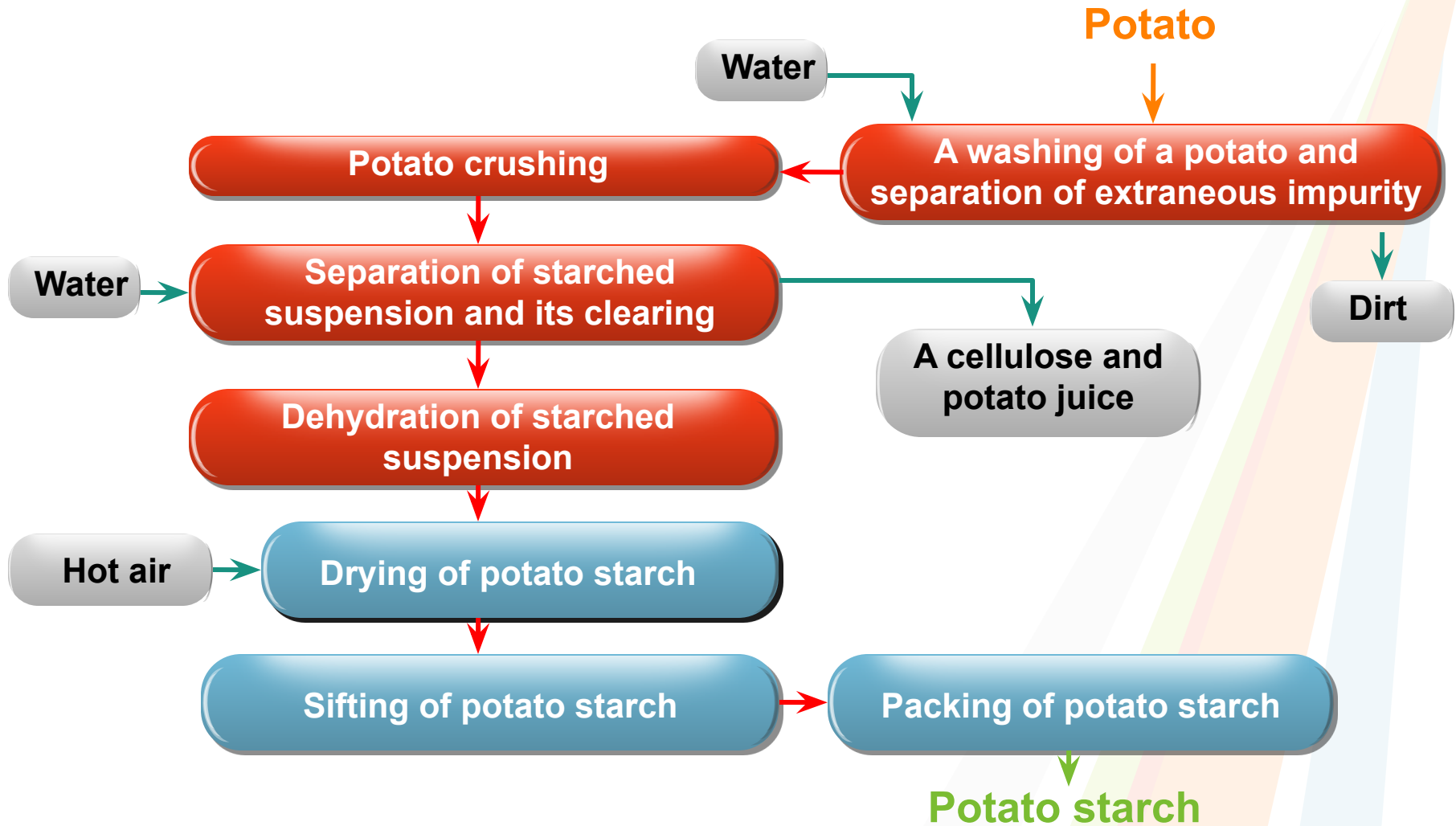


Drawing. Peripheral site of a cross-section of a tuber of a potato:
st - starched grains.

The starch content in potato tubers fluctuates from 8 to 29 %, at the average it is 18 %

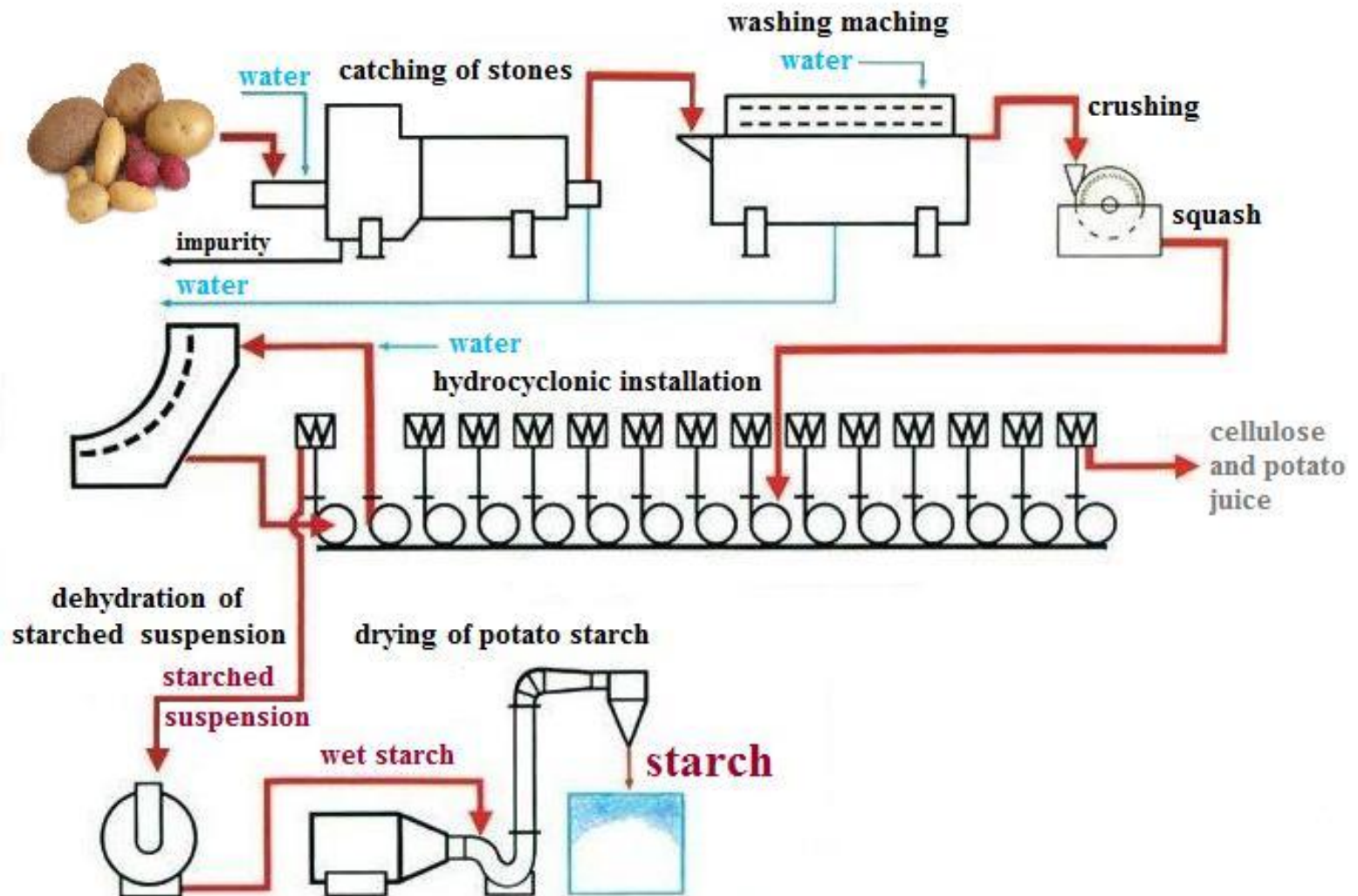
2.8. Technology of reception of potato starch in industrial conditions

Manufacture process of potato starch consists of next stages:





The machine-instrument scheme of manufacture of potato starch





Process of manufacture of potato starch

At first the potato moves in the washing machine with catching of stones. Water stream carries by tubers over catching of stones, and more heavy stones are caught and gather on the special conveyor of catching of stones. Then the potato arrives in rotating drum of the washing machine in which from a surface of tubers remove a dirt, decay, a mold.

Then a potato crush on the grating machine. The squash is got from a cellulose, potato juice and water starched suspension.

Hydrocyclonic installation is applied to its separation. Division occurs under the influence of centrifugal force and is based on distinction in density of water, a cellulose and starch. The received starched suspension is cleared by repeated washing by water.

The cleared starched suspension arrives on the drum-type vacuum-filter for dehydration to 64 %concentration of solids.

Wet starch is dried up in the spray-type dryer by moderately hot air.

Starch sift on a thin sieve for removal of any lumps.

The cleared dry starch pack up.



2.9. Reception of potato starch in house conditions

2.9.1. Technology of reception of starch in home conditions

1. To wash out a potato from sand and the earth;
2. To crush on a grater, a mincing machine or a squeezer;
3. To wash out a squash on a sieve;
4. To settle the received starched milk;
5. To pour separated liquid;
6. To dry up the received wet starch;
7. To crush rolling pin or in another method;
8. To sift the dried up starch.

Starch is ready.



2.9.2. The list of the necessary equipment and stock



To start to process of receipt of starch, I have prepared next equipment and stock:

- 2 bowls;
- A food processor;
- A pan;
- A colander;
- A baking tray;
- A paper for a baking;
- A rolling pin;
- A sieve;
- A plate.



2.9.3. Process of reception of starch in house conditions



1. In May I together with a family planted a potato on a summer residence:





Process of reception of starch in house conditions



2. In September we reaped a crop:





Process of reception of starch in house conditions



3. I washed out a potato from sand and the earth:





Process of reception of starch in house conditions



4. I crushed a potato on a food processor:





Process of reception of starch in house conditions



5. I washed out a squash on a colander:





Process of reception of starch in house conditions



6. I have allowed time to the received starched milk to settle:





Process of reception of starch in house conditions



7. I merged separated liquid:





Process of reception of starch in house conditions



8. I laid out crude starch a thin layer on a paper for a batch for drying:





Process of reception of starch in house conditions



9. After drying of starch within several days, I crushed the dried up starch a rolling pin:





Process of reception of starch in house conditions



10. I sifted the crushed starch:



Starch is ready



3. Results of research



- As a result of the spent work potato starch in house conditions has been received. For acknowledgement of conformity of quality of the given starch to the starch received in industrial conditions, the following has been made:
 - In shop starch has been bought.
 - From the starch received in house conditions, and the starch bought in shop, it has been welded two samples of kissel.
 - The depersonalized samples of kissel have been given on tasting to five people - to members of my family.
 - Results of tasting: 3 persons haven't noticed any difference; 1 person has noticed an insignificant difference in a consistence - the kissel welded on starch, bought in shop, has seemed slightly more densely; 1 person noted in the kissel welded from starch, received in house conditions hardly – notable smack of a potato.
- By result of tasting it is possible to draw a conclusion that difference of quality of the starch received in house conditions, from quality of the starch bought in shop, insignificant.



4. Conclusion



My hypothesis has been proved. To receive starch in house conditions probably. Simply for this purpose are necessary defined equipment and stock, and also desire to achieve the object, patience and diligence.



5. The list of the used literature



1. The big Soviet encyclopedia.
2. Botany (in two volumes). Volume 1. Anatomy and morphology. For teacher training colleges and universities. Kursanov L.I., Komarnitskij N.A., Mejer K.I., Razdorsky V. F., Uranov A.A. The edition 5, reworks. M: Education, 1966. 423 pages.
3. The Scientific and technical concept of development of manufacture of starch. Nikolay Rufeevich Andreev. The director of all-union scientific research institute of starch-treacle.
4. Ryzhakova A.V. Tovarovedenie and examination of the confectionery goods: the textbook for students of higher educational institutions. - M: Publishing center "Academy", 2005. 224 pages.

The background features a grid of light gray squares. From the left side, several colorful rays (green, orange, blue, and gray) converge towards a central point. From this point, a thick green line extends to the right, with several thinner rays branching out. In the upper right area, there is a faint line graph with two lines, one orange and one blue, showing an upward trend. Scattered throughout the background are various strings of binary code (0s and 1s) in a light green color.

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Thank You!