Practical Approach to Simplified Synthesis of *Cepelinas*

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Were you ever frustrated by obscure regular recipes? Have you ever wondered about the volume of the spoon in "a spoonful"? Isn't there a place for a chef that likes to follow strict and unambiguous instructions?

Well wonder no more, for this is the world's very first completely thorough manual for making a native Lithuanian dish - a recipe, if you will - for people who like their rules strict and their instructions thorough. However...

A *Cepelinas* is a very complex system, and discrete instructions to make one would be far too difficult to follow; instead, some simplifications will be made. Warning: the simplified model may or may not work well with other complex systems, such as a human digestion system. Consume at your own risk.

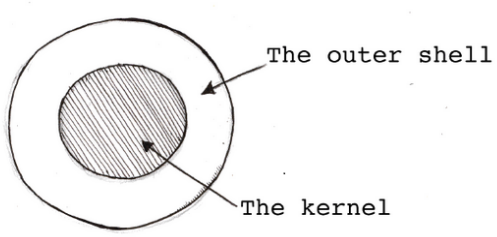

Fig. 1. Cross-section of *Cepelinas*

Ingredients

1500.0 g of pre-peeled tubers of *Sulanum tuberosum,* further abbreviated as potatoes; desired overall amylose and amylopectin content is to be over 18%. If peeled tubers are not available, preparation is well covered in a related study "Peeling the unpeelable: the mighty potato".

150.00 g of meat from *Sus domesticus,* desired fat content 33%-38%

100.00 g of meat from *Bos taurus,* desired fat content <10%

one bulb of *Allium cepa*

an abundance of sodium chloride

Part one: the outer shell

1. Divide the tubers to the ratio 1:2 by mass; the smaller part is to be boiled, which is a highly dangerous operation, so adult supervision is advised. The bigger part is to be grinded with a piece of heavy machinery; adult supervision is compulsory. Proceed with caution; it's not too late to back down!

2. Using a system of rotating knives in a concealed plastic container grind the potatoes; again, there is an almost inevitable risk of getting badly injured. Simulate a semi-permeable membrane using a few layers of fine cloth. Attempt to pass the grinded potato mass through it. Collect the filtrate: it is a colloidal suspension of starch nanoparticles. Centrifuge and decant the suspension to separate the starch, then apply it back to the main potato mass. Note that the decanted solution is a potent cure for various stomach problems; it's very likely to come in handy after having one too many Cepelinas.

3. Prepare two liters of 0.171M solution of sodium chloride in water; this can be achieved (within acceptable bounds of error) by dissolving 20.0 grams of dry sodium chloride in 2.000L of water. Place the solution in a heat resistant container and apply heat; it should start to boil (according to Raoult's law) at 373.52 K assuming the pressure is 101325 Pa. Once the boiling is intensive, place the smaller fraction of potatoes (divided in section 1) into the container.

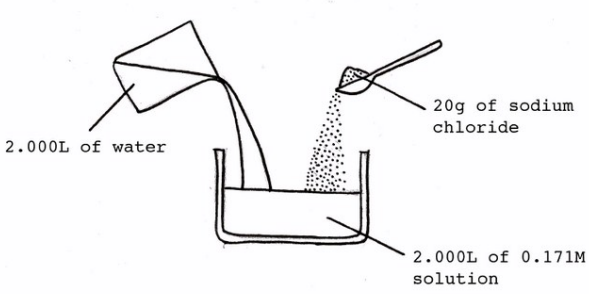

Fig. 3. Boiling solution preparation procedure

You may cover the container with some sort of a backward condenser to conserve heat; raising atmospheric pressure will raise the boiling point which is also beneficial. After 1200s stop the heating and decant. Collect boiled tubers and grind them using any accessible grinding tool.

4. You should now have two separate portions of grinded potato mass. Mix them together until a homogenous mixture is formed, then add 0.2564 mol of dry sodium chloride to keep the right osmotic pressure. This newly produced concoction (NPC) is ready to be molded into a shape of one's desire, in this specific case - an outer shell of a Cepelinas.

Part two: the kernel

5. Grind all the ingredients of the kernel using a set of knives rotating in a spiral manner, pushing the grinded mass through a set of holes (hole diameter approx. 4-6mm). Apply sodium chloride (15.00g) and mix it in. The basic kernel material (BKM) is now ready.

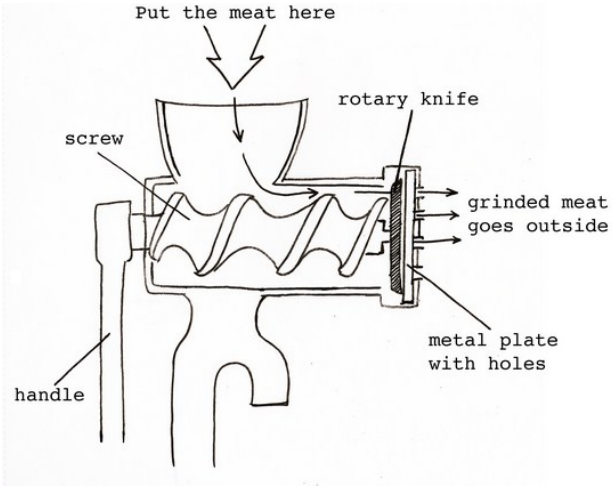

Fig. 2. Meat grinding process

Part three: the fusion

6. Use your palms to form balls out of BKM, which should be then covered with a thick layer of NPC (according to the diagram). Newly produced raw Cepelinas are to be boiled (see 3) in 0.171M solution of sodium chloride. The volume of this solution needed to boil can be calculated using the following equation:

$$V = n \cdot 0.5000L \quad ,$$

where V is the volume needed and n is the number of Cepelinas

Cepelinas should only be placed into boiling solution and boiled for approximately 1200 seconds. Stirring is highly recommended. Once 1200 seconds have passed, heating should be stopped and freshly boiled Cepelinas should be decanted.

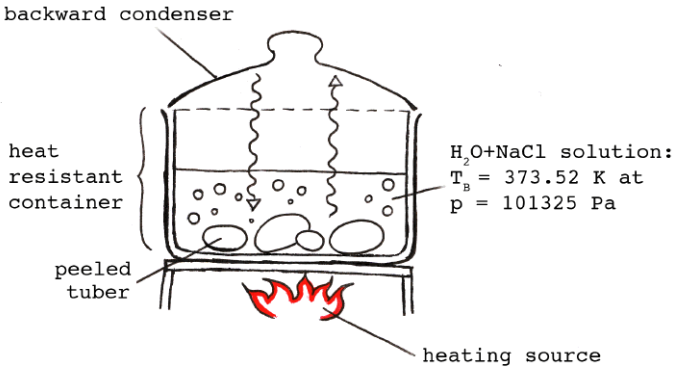

Fig. 4. Boiling process

Congratulations! You should now possess some precisely crafted Lithuanian dish!

**Liudvikas won silver medal in EUSO2010/Gothenburg, Sweden.*