

## Practical activities - Laboratory work: Freezing plant cells of apple – Malus Domestica

Student name:	Class:	Year: 2018/2019
<b><u>Name of the project: CONSERVATION OF FOOD</u></b>		
<b>Theme:</b>	<b>Freezing plant cells of apple – Malus Domestica</b>	
<b>Task:</b>	Prepare the apple cells for freeze-drying with sugar pack and freeze-drying with syrup pack	
<b>Materials and tools:</b>	Malus-apples, knife, tray, bowls, beaker-pot, digital weight, sugar, acid of lemons	
<b>Working process:</b>	<p style="text-align: center;"><u>Two types of freezing apple plant cells</u></p> <p>A.) <i>Freeze-drying with sugar pack</i>: realized by the first group</p> <ol style="list-style-type: none"> <li>1. Peel the apples, cut out the core and slice them into 3-4 mm pieces. Place these small pieces on a tray.</li> <li>2. Completely cover the pieces with sugar. Each piece of apple need to be covered.</li> <li>3. Frozen dried fruit keep in storage fridge with -10 to -18 degrees.</li> </ol> <p>B.) <i>Freeze-drying with syrup pack</i>: realized by the second group</p> <ol style="list-style-type: none"> <li>1. Prepare the sugar solution into a bowl. Put 0,25 kg of sugar melt it in 1 l cold water.</li> <li>2. Add four laboratories spoon of crystal acid of lemons into the sugar solution. Be sure it melts and carefully mix it up.</li> <li>3. Take all the apple pieces and dip it into a syrup, than place them on a tray.</li> <li>4. Frozen dried fruit keep in storage fridge with -10 to -18 degrees.</li> </ol>	

<p><b>Development off method:</b></p>	<p><i>Freezing - drying with sugar pack the fruit didn't change the consistence, colour or the size. After a few minutes surface oxidation has started.</i></p> <p><i>Freezing - drying with syrup pack the fruit didn't change the consistence, colour or the size. It changed the storage of the food thanks to <b>acid of lemons</b>.</i></p> <p><b><u>Conclusion:</u></b></p> <ul style="list-style-type: none"> <li>- During the freezing fruit is protect by sugar and acid of lemons in fact of enzymes activity. Freezing is consider as the best storage methods also for preserving higher vitamin C.</li> <li>- When you follow the instructions carefully, fruit should last out in a fridge for 10 – 12 months under -18 degrees.</li> <li>- Temperature of -18 degrees is accepted as a safe storage temperature for extended shelf of a frozen food because the ice crystals are small and do not damage food</li> <li>- Temperature of 0,5 to -5 degrees increases the cost of frozen food because ice crystals are big and damage the food cells causing loss of texture, nutrients and flavour on thawing</li> </ul>