Time method and my competences.

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Supervisors: PhD. Piret Raudsepp, prof. Tõnu Püssa, dr. Artur Kuznetsov

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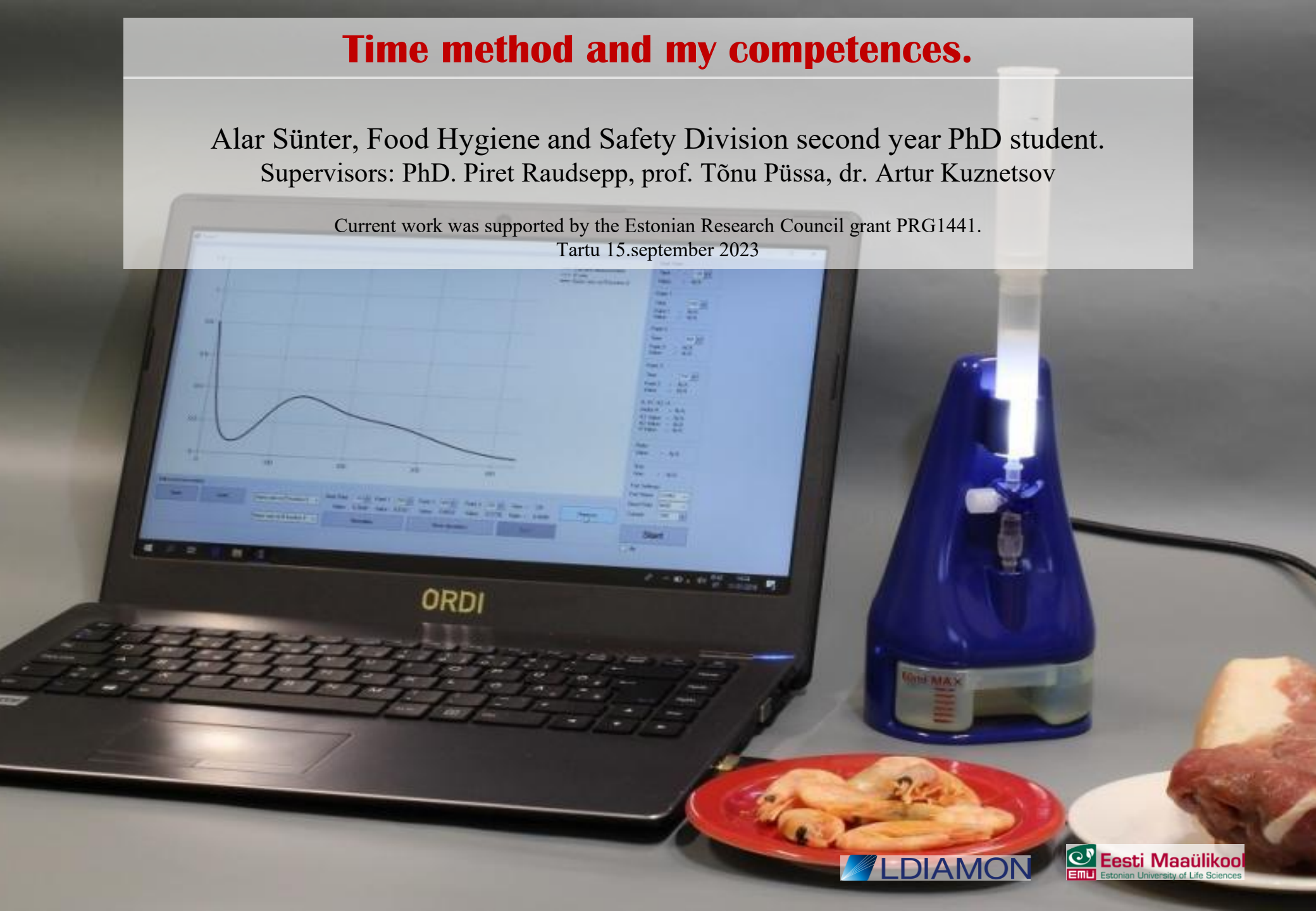
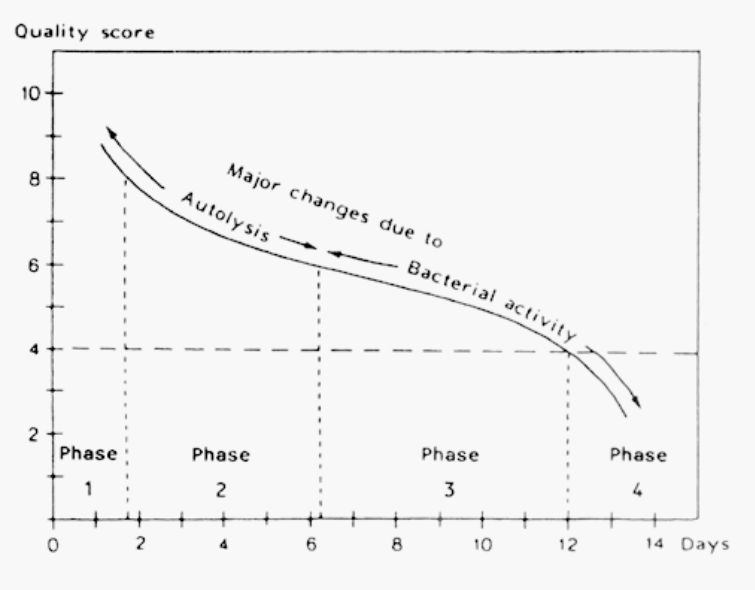
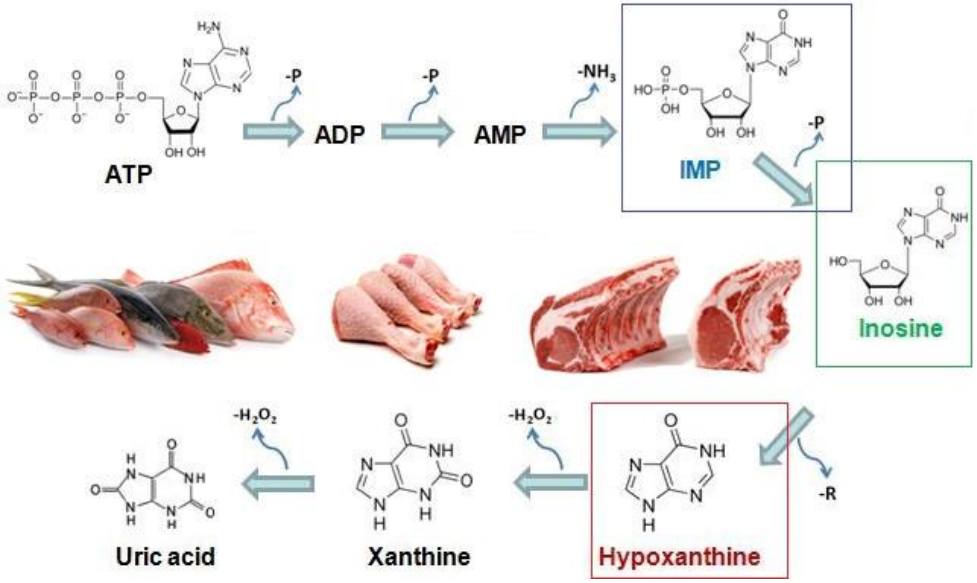
Tartu 15.september 2023



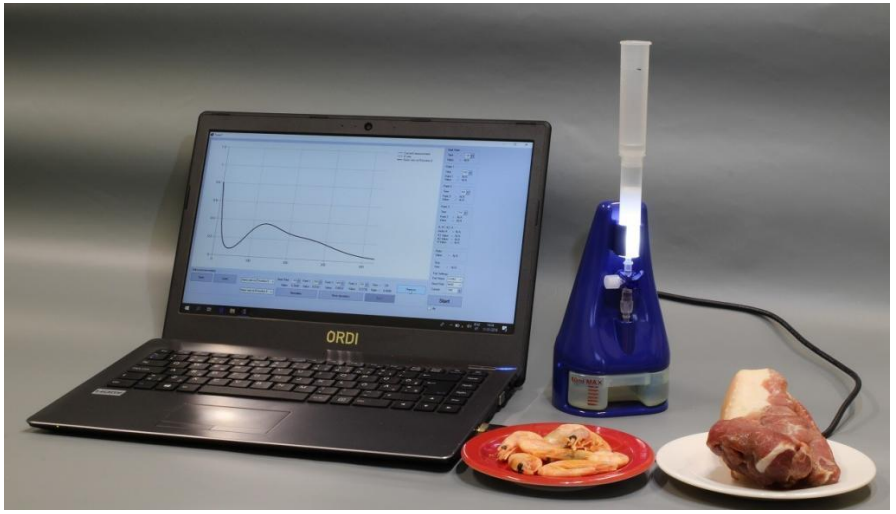
Describing of aging processes in all foods of animal origin.



Changes in the eating quality of iced (0°C) cod (Huss, 1976)



http://www.novocib.com/Freshness_Assay_Kits.html



Meat Sensor A.S. Ldiamon, FPMLC method.

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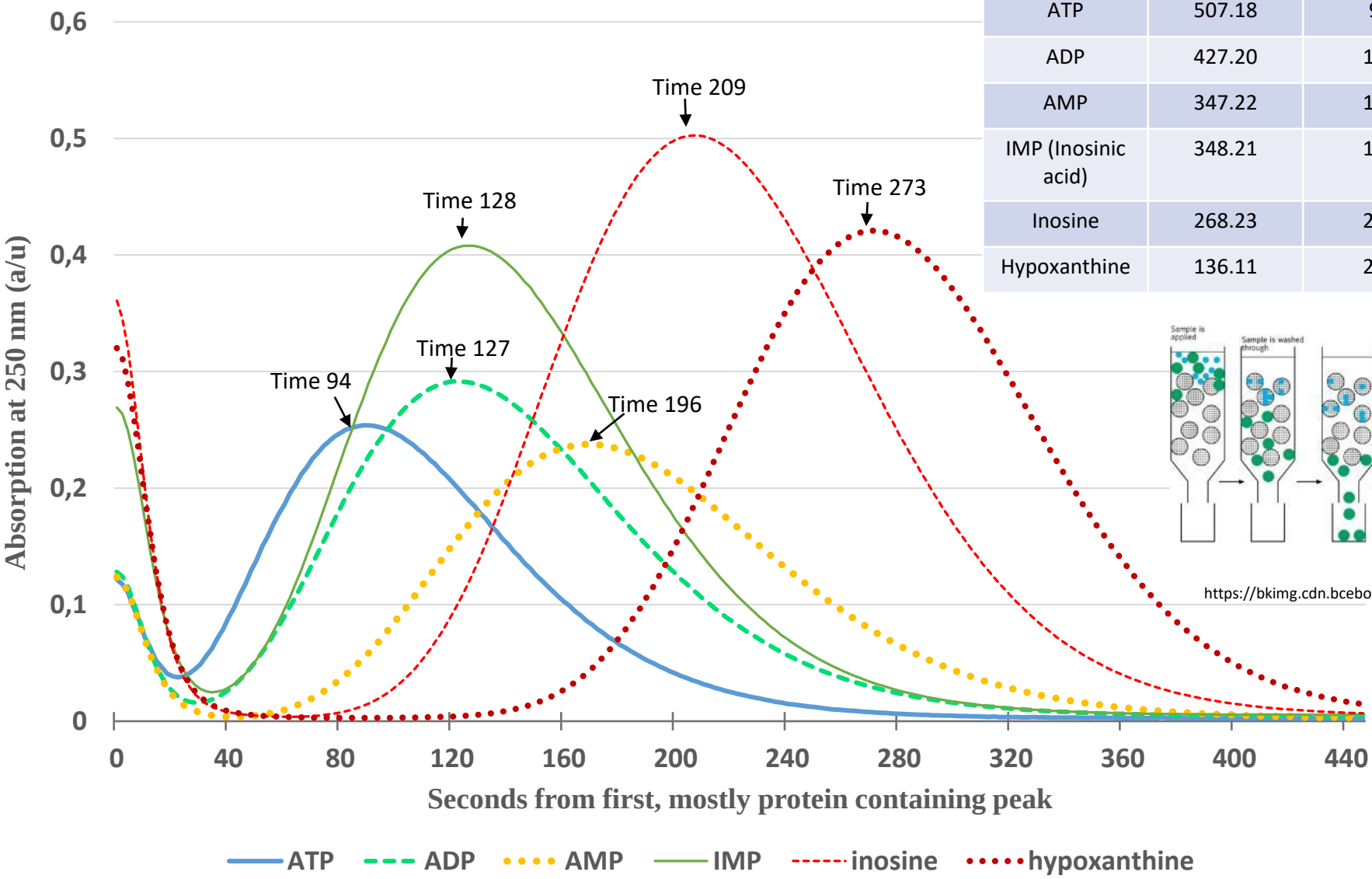
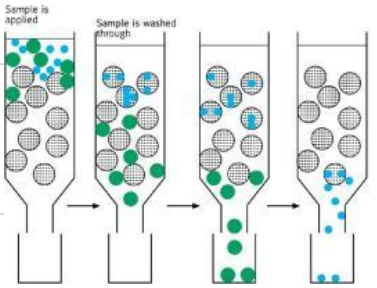
Explanation of Time value.

Compound	Molecular weight (Da)	Time (sec)
ATP	507.18	94
ADP	427.20	127
AMP	347.22	196
IMP (Inosinic acid)	348.21	128
Inosine	268.23	209
Hypoxanthine	136.11	273





https://bkimg.cdn.bcebos.com/

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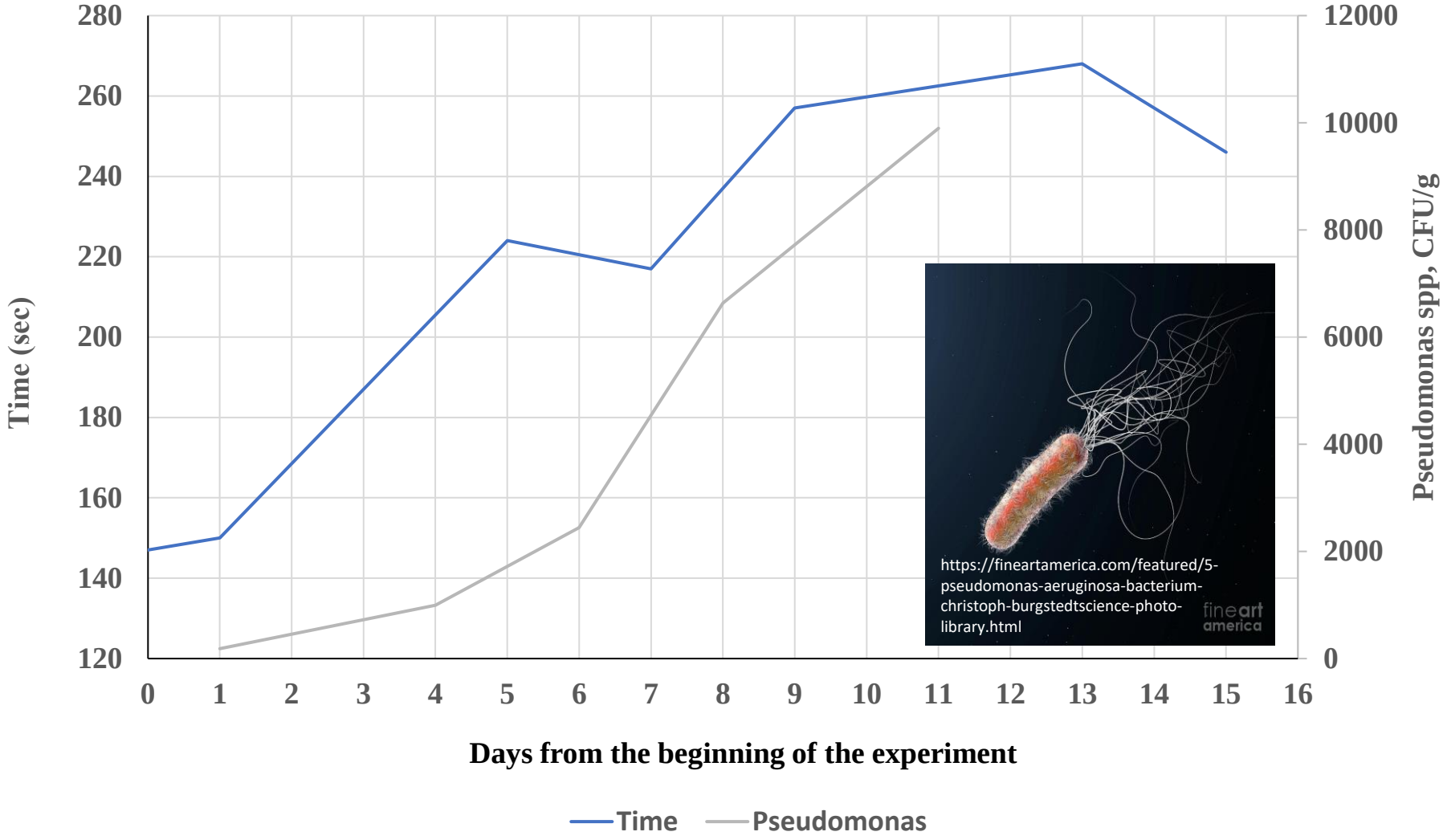
Comparison of Time values with the count of Pseudomonas in minced pork.



Pseudomonas is a most common genus of bacteria in food.
The best-known pathogenic species of them is *Pseudomonas aeruginosa* (Wikipedia).

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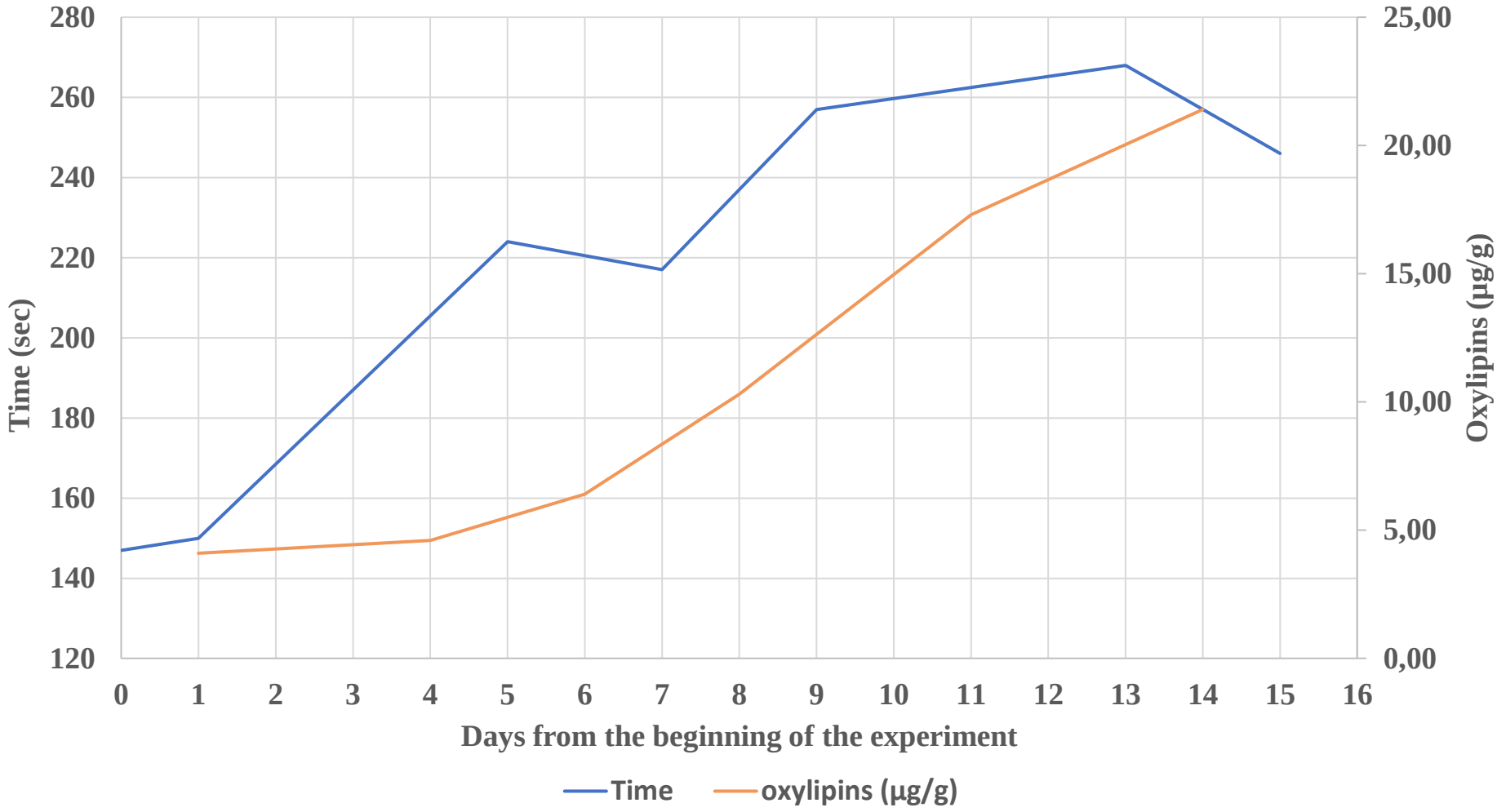
Comparison of Time values with the concentration of oxylipins in minced pork.



Oxylipins are substances that are formed by the oxidation of fatty acids with oxygen.
Many of them have important functions in the functioning of the organisms and are toxic in high concentrations (Wikipedia).

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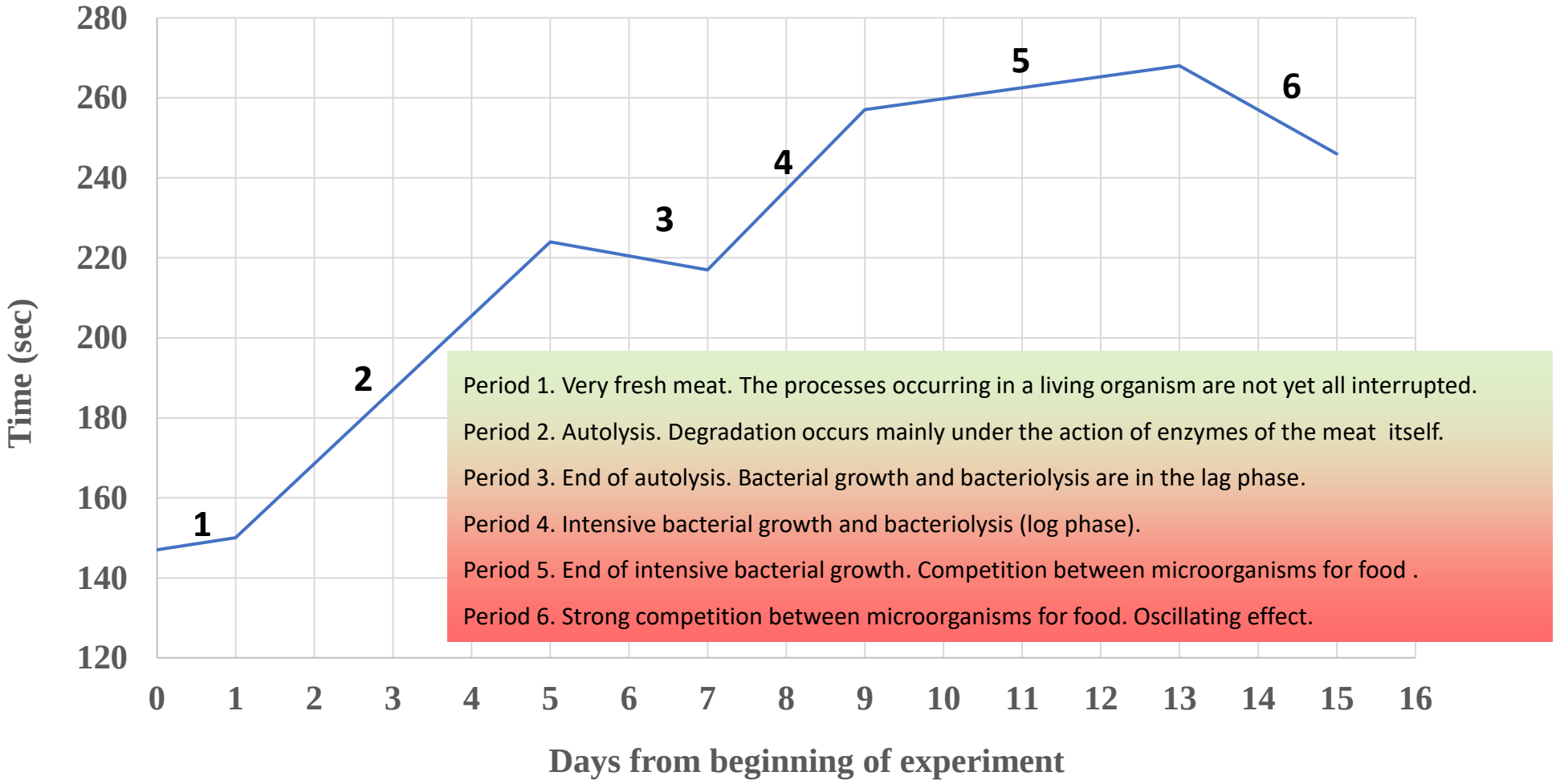
Changes in Time values when storing minced pork in the refrigerator(~ 4°C).
Periods in the preservation of minced pork.



Period 1. Very fresh meat. The processes occurring in a living organism are not yet all interrupted.

Period 2. Autolysis. Degradation occurs mainly under the action of enzymes of the meat itself.

Period 3. End of autolysis. Bacterial growth and bacteriolysis are in the lag phase.

Period 4. Intensive bacterial growth and bacteriolysis (log phase).

Period 5. End of intensive bacterial growth. Competition between microorganisms for food .

Period 6. Strong competition between microorganisms for food. Oscillating effect.

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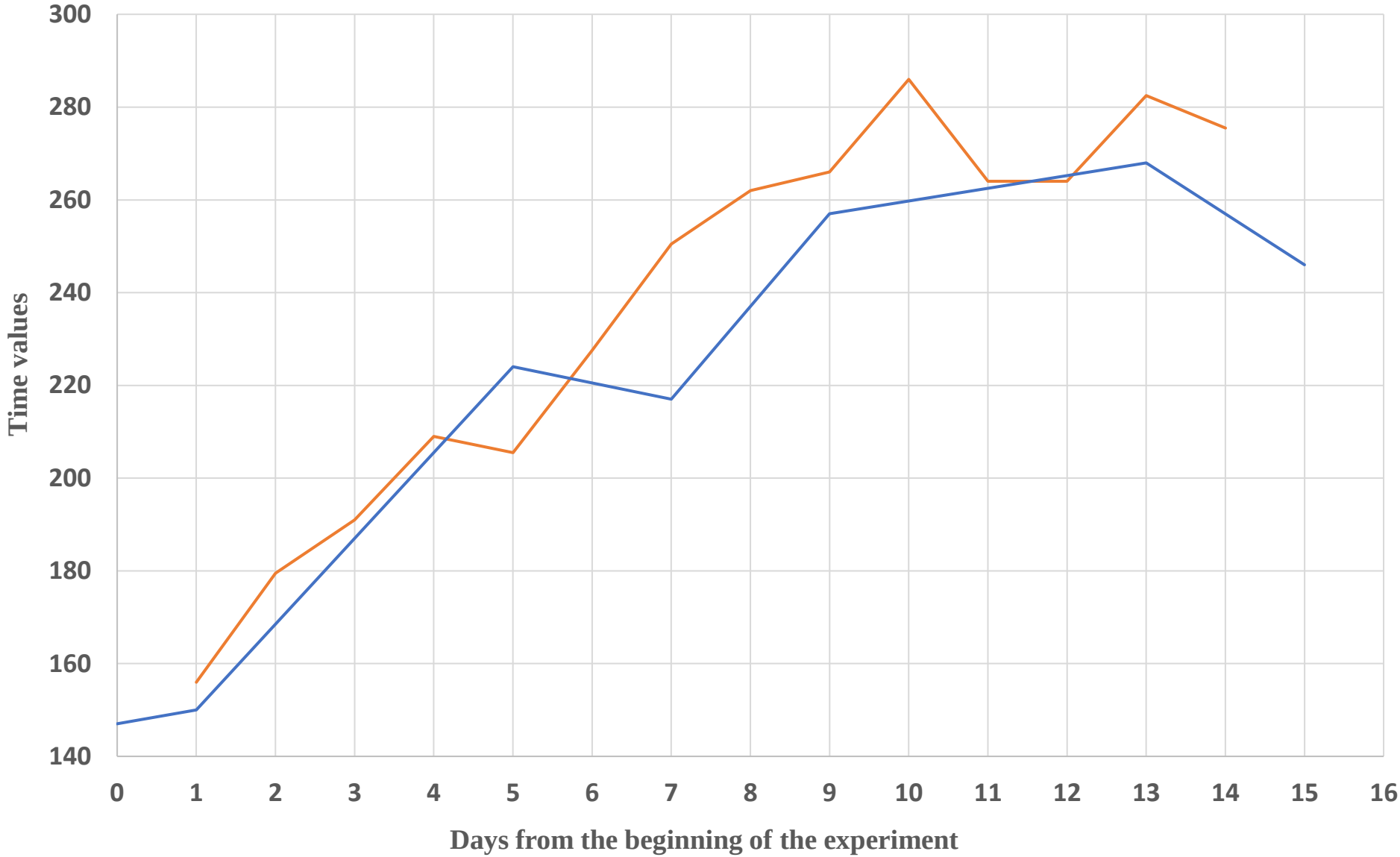
Comparison of Average Time values from different experiments.



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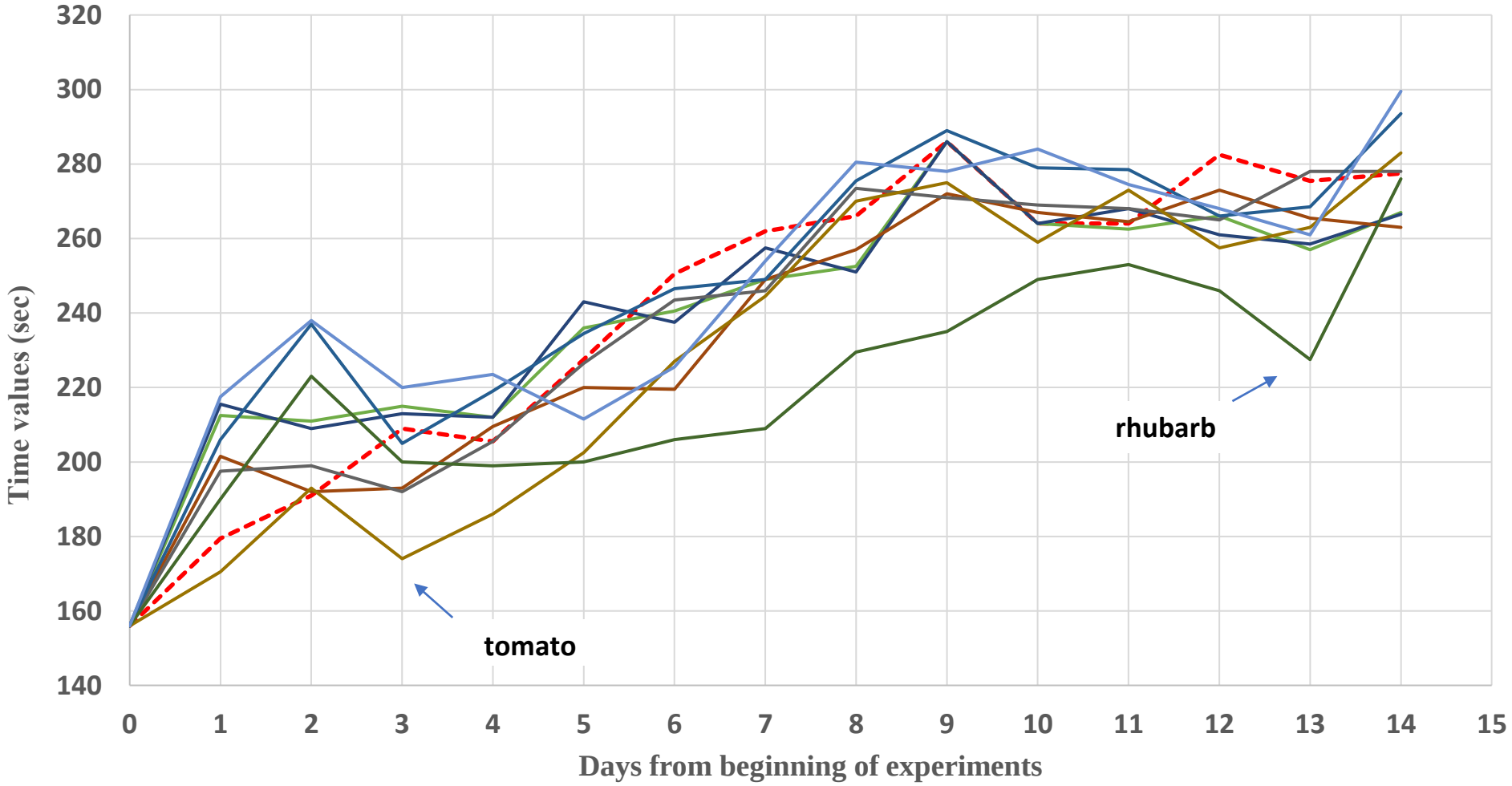
Average Time values after adding plant matherial.



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Publications about evaluation of food quality.

Sünter, Alar; Kuznetsov, Artur; Raudsepp, Piret; Püssa, Tõnu; Toom, Lauri; Konoplev, Georgii; Stepanova, Oksana S.; Stepanova, Oksana V.; Lyalin, Daniil; Frorip, Aleksandr; Roasto, Mati (2023). **Manifestation of heat-induced valuable dietary nucleotide salvage in food prepared from aged fish in fast protein and metabolites liquid chromatography, ATP-bioluminescence assay, and NMR spectra**. AppliedChem, 334−349. DOI: **10.3390/appliedchem3020021**.

Kuznetsov, Artur; Frorip, Aleksandr; **Sünter, Alar**; Kasvand, Nensi; Korsakov, Vadim; Konoplev, Georgii; Stepanova, Oksana; Rusalepp, Linda; Anton, Dea; Püssa, Tõnu; Roasto, Mati; Abramova, Liubov; Kozin, Andrey; Toom, Lauri; Hirsch, Soeren; Mukhin, Nikolay (2023). **Fast Protein and Metabolites (Nucleotides and Nucleosides) Liquid Chromatography Technique and Chemical Sensor for the Assessment of Fish and Meat Freshness.** Chemosensors, 11 (1), ARTN 69.
DOI: **10.3390/chemosensors11010069**.

Sünter, Alar; Kuznetsov, Artur; Püssa, Tõnu (2023). Toores lihas toimuvate protsesside jaotus perioodideks energiarikaste nukleotiidide (ATP) laguproduktide sisalduste muutumise alusel [**Division of the processes occurring in raw meat into periods, based on changes in the contents of energy-rich nucleotides (ATP) breakdown products,** in Estonian]. *Konverentsi Terve loom ja tervislik toit 2023 artiklite kogumik: Terve loom ja tervislik toit 2023 [**Collection of articles from the Converence, Healthy Animal and Healthy Food**], Tartu, 1.-2.03.2023.* Toim. Aland, Andres. Tartu, Estonia: Eesti Maaülikooli veterinaarmeditsiini ja loomakasvatuse instituut [Institute of Veterinary Medicine and Animal Sciences of Estonian University of Life Sciences], 34−39.

Kasvand, Nensi; Frorip, Aleksander; Kuznetsov, Artur; Püssa, Tõnu; Rusalepp, Linda; **Sünter, Alar**; Anton, Dea (2021). **A new approach for evaluation of meat freshness**. *Conference proceedings: 5th International Conference of Optical Characterization of Materials, March 17th - 18th, 2021.* Karlsruhe, Saksamaa: KIT Scientific Publishing, 21−29. DOI: **10.5445/KSP/1000128686**.

Püssa, Tõnu; Frorip, Aleksander; Kuznetsov, Artur; **Sünter, Alar**; Anton, Dea; Raudsepp, Piret (2018). **New freshness index, method, and device to determine freshness status of meat and fish**. *DigICoMST website - http://icomst-proceedings.helsinki.fi/index.php., 64th International Congress of Meat Science and Technology (ICoMST 2018), Grand Hyatt, Melbourne, Australia, 12-17. august..* Ed. Eero Puolanne. Helsinki, Finland: Helsinki University.

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My competences:

- Low pressure chromatography
- 1D and 2D electrophoreses
- Immunomethods
- Light microscopy
- Cell culture experience
- Identification of unknown proteins

Some of Publications on various topics with material and methods section added by me:

- Kuznetsov, Artur; Frorip, Aleksandr; **Suenter, Alar**; Korsakov, Vadim; Konoplev, Georgii; Stepanova, Oksana; Roschina, Natalia; Ovsyannikov, Nikolay; Lialin, Daniil; Gerasimchuk, Roman; Dmitriev, Alexander; Mukhin, Nikolay; Hirsch, Soeren (2022). **Optical Chemical Sensor Based on Fast-Protein Liquid Chromatography for Regular Peritoneal Protein Loss Assessment in End-Stage Renal Disease Patients on Continuous Ambulatory Peritoneal Dialysis.** Chemosensors, 10 (6), ARTN 232. DOI: 10.3390/chemosensors10060232.
- Mikelsaar, A.-V.; **Sünter, A.;** Toomik, P.; Karpson, K.; Juronen, E. (2009). **New Anti-Ku80 Monoclonal Antibody F10H2.B3 As a Useful Marker for Dividing Cells in Culture.** Hybridoma, 107-111. DOI10.1089/hyb.2008.007.
- Mikelsaar, A.-V.; **Sünter, A.**; Toomik, P.; Karpson, K. (2008). **Identification of New Cell Surface Markers For Human Neural Stem/Progenitor Cells**. HUPO 2008 7-th world congress, Amsterdam, 16-20 august. Wiley-V C H Verlag Gmbh.
- Mikelsaar, A.V.; **Sünter, A.**; Toomik, P. (2007). **Is titin a human nuclear and chromosomal protein?** Chromosome research: 6th European Cytogenetics Conference (6th ECC). Holland: Springer, 260-260. (15)
- Ingerpuu, S.; Piirsoo, A.; **Sunter, A.**; Pihlak, A. (1996). **Carbohydrate specific monoclonal antibody IGR/2 1A6 initiates myeloid cell homotypic aggregation .** Tissue Antigens, 48. MC209-MC209

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