## **Abstract**

Charles University, Faculty of Pharmacy in Hradec Králové

Department of: Pharmaceutical Technology

Consultant: PharmDr. Petra Svačinová, Ph.D.

Student: Daniel Višňovský

Title of Thesis: Evaluation of flow properties, compressibility and

tablet properties of mixtures containing

microcrystalline cellulose and TRI-CAFOS ® 200-7

Direct compression technology has simplified the tabletting process by allowing immediate compression of tablets without the need of granulation. However, this applies high demands on the tableting mixture. In particular, the excipients must exhibit good compressibility and excellent flow properties. Lubricants are important for influencing these properties, but may ultimately have a negative effect on the properties of the tablets. Due to its structure and properties, Tri-Cafos ® 200-7 is a material that could be used as a lubricant.

The main task of this work was the evaluation of Tri-Cafos® as a lubricant in tableting. Magnesium stearate was used as a reference substance. In mixtures with microcrystalline cellulose, the flow properties were evaluated by the flow trough an orifice method and the Hausner ratio. After subsequent compression of tablets with three compression forces (5 kN, 7.5 kN and 10 kN), the compression process was evaluated using the force-displacement record and also the properties of the compressed tablets such as tensile strength, friability, disintegration time and elastic relaxation were measured. Tri-Cafos® improved flow properties compared to microcrystalline cellulose. Compared to magnesium stearate, it also has a smaller effect on tablet tensile strength, does not negatively affect friability and shortens disintegration time. Its disadvantage is the high values of the ejection force. Friability was significantly lower for Tri-Cafos® compared to magnesium stearate. Elastic relaxation values were comparable to magnesium stearate. Based on the results, it can be stated that Tri-Cafos® can be used as a lubricant in the manufacture of tablets.

Possible negative effects can then be solved, e.g. by adjusting concentration or process parameters.