# 2. ABSTRACT

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**Title of master thesis:** The influence of physical activity on energy metabolism parameters of pregnant and lactating women

**Background:** The aim of our work was to compare changes in the parameters of energy metabolism and then evaluate the relationship between these parameters and the parameters of physical activity of pregnant and lactating women.

**Methods:** Evaluation of energy metabolism was carried out by the method of indirect calorimetry. The calorimeter can estimate the resting energy expenditure (REE) and oxidation of individual nutritional substrates (after determining the amount of nitrogen excreted in the urine). To determine the parameters of physical activity, women were given to complete a 7 days questionnaire, which was evaluated on the basis of recalculation using metabolic equivalents.

**Results:** In our study, we observed an increase in REE during pregnancy in the third trimester and an increase in volume of oxygen consumption ($VO_2$) and volume of carbon dioxide production ($VCO_2$) compared to lactating women. The values of respiratory and non-protein respiratory quotient remained unchanged. In case of oxidation of nutritional substrates, we noticed only increased oxidation of lipids before the end of pregnancy compared to the period of breastfeeding. We found positive correlations between physical activity level and carbohydrate oxidation and between the energy required for sleep and REE, $VO_2$ and $VCO_2$ during breastfeeding.

**Conclusions:** These results of an increase in REE, $VO_2$ and $VCO_2$ during pregnancy confirm that the mother's body needs extra energy to ensure physiological changes. Increased lipid oxidation saves glucose and amino acid energy for the fetus.

**Keywords:** physical activity, energy metabolism, pregnant women, lactating women, indirect calorimetry