

## Summary

The aim of this doctoral thesis was to examine the effects of sheep colostrum on selected parameters of mature and acne-prone skin. The effects of ovine colostrum have not been as thoroughly studied as bovine colostrum.

At the initial stage of the research, an original formula of a cosmetic product in the form of an emulsion containing ovine colostrum from Polish sheep as the active component was developed. Subsequently, the effects of the prepared cosmetic product with sheep colostrum on mature skin were evaluated in an 8-week randomized, double-blind, placebo-controlled trial involving 52 volunteers. The study included: measurement of skin hydration based on the water content in the stratum corneum; evaluation of transepidermal water loss (TEWL); measurement of hemoglobin (erythema) and melanin levels; assessment of sebum levels in the skin; measurement of skin viscoelastic properties; photographic documentation of the skin condition before and after the application of the product; and a subjective assessment of the skin condition by the participants before and after the use of the product. In the second 8-week study involving volunteers (30 people), the effect of the cosmetic product with ovine colostrum on acne-prone skin was evaluated. The study included measurements of sebum levels on the skin, evaluation of skin hydration, determination of transepidermal water loss (TEWL), and subjective assessment of the skin condition by the participants, focusing on the presence of blackheads, papules, pustules, erythema, as well as skin hydration, seborrhea, and overall skin condition.

The evaluation of the effects of sheep colostrum on selected parameters of mature and acne-prone skin was preceded by a literature review and *in vitro* studies. The *in vitro* studies of ovine colostrum demonstrated its antioxidant properties, as well as its high ability to stimulate fibroblast growth and moderate ability to stimulate keratinocytes. Given the slowed cellular division in aging skin, this may translate into anti-aging and regenerative properties. Studies conducted on fibroblasts from diabetic patients demonstrated stimulation of their proliferation (Ki67) and migration, as well as an increase in the expression of anti-inflammatory proteins (TSG-6) and a reduction in pro-inflammatory IL-6, suggesting a positive effect on healing processes.

The confirmed biological activity of sheep colostrum suggests its beneficial effects on both healthy and diseased skin. Objective studies following the use of a cream containing ovine colostrum showed a statistically significant improvement in hydration, a reduction in transepidermal water loss, and an improvement in skin elasticity. The subjective evaluation

by the participants and the photographic documentation confirmed the instrumentally obtained results, as well as indicated improvements in skin softness, pore smoothing, and erythema reduction.

The effect of the cream with colostrum also proved to be effective in individuals with acne-prone skin. The reduction in sebum secretion and improvement in hydration allowed the skin to maintain good condition. Regular use of the cream with colostrum also led to a reduction in acne lesions such as blackheads, papules, and pustules. Therefore, the colostrum cream can support acne-prone skin care during dermatological treatment, for example, with the use of retinoids, by improving the epidermal barrier.

These results indicate the potential for its use in dermatology, including for skincare purposes.