

(Attached document)

1. Examination of Sun Cellobio®-K cello-oligosaccharide in an animal model of osteoporosis

Soy isoflavone is called phytoestrogen because it has a similar structure to the female hormone (estrogen) and has been reported to improve bone metabolism. In particular, equol, a metabolite of the major isoflavone daizein, is known to have the highest bioactivity among isoflavonoids. Daizein is known to be converted to equol by enterobacteria. In this research, a mouse model of post-menopausal osteoporosis was used to examine the impact of the concomitant intake of soy isoflavone and Sun Cellobio®-K on whether it increases equol production or not and on the bone density and strength.

【Study method】

Eight-week-old ddY female mice were used as test animals. After ovariectomy (OVX) or sham surgery (Sham) was performed, the mice were divided into five groups: Sham group, OVX group, ISO group (OVX + 0.16% isoflavone glycoside), COS group (OVX + 5% Sun Cellobio®-K; Nippon Paper Industries Co., Ltd.), and IC group (OVX + 0.16% isoflavone glycoside + 5% Sun Cellobio®-K). The mice were then reared and observed for six weeks. After rearing and observation were completed, the mice were dissected and measured in terms of uterus weight, bone density of femur and tibia, and bone metabolism markers. The amount of feed given was the same in all groups.

【Result】

Uterus weight was significantly lighter in all four of the OVX-treated groups in comparison to the Sham group, and no uterine hypertrophy due to isoflavone and cello-oligosaccharide was observed. The level of excreted equol in urine was significantly higher in the IC group as compared to the ISO group. The density of femur was significantly lower in the OVX group than in the Sham group, but reduction of the bone mass was suppressed significantly in both the ISO and IC groups. The bone density of tibia also demonstrated the same tendency. Bone strength was also reduced due to OVX, but this reduction tended to be suppressed in the ISO group and was significantly suppressed in the IC group. The resulting level of equol in urine and bone strength are shown in the figures below (a significant difference exists among the different letters shown).

【Conclusion】

Concomitant intake of soy isoflavone and Sun Cellobio®-K was found to improve equol production. The suppression of bone mass reduction by OVX was the same as the isoflavone-alone group, but the concomitant intake of both was shown to suppress the reduction in bone strength more than the single intake of each.

