Title Extension, anatomy and metabolic activity of leaves in minimally processed leek stalks

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Abstract

When leeks are processed as trimmed stalks, the major problem that arises is inner leaf extension. With the aim to study leaf extension in trimmed stalks, leek pseudostems were initially trimmed at 20 cm from their base and sorted into three experiments. In the first experiment, the stalks were further cut at 2, 4, 6, 8, 10, 12, 14, 16 or 18 cm from the base resulting in two complementary parts: the lower part of 0–2, 0–4, 0–6, 0–8, 0–10, 0–12, 0–14, 0–16 or 0–18 cm and the respective upper part of 2–20, 4–20, 6–20, 8–20, 10–20, 12–20, 14–20, 16–20 or 18–20 cm; in the second experiment, the leaves were detached from the stalk base and marked at 2 cm intervals (leaf-parts), and in the third experiment, detached leaves were grouped into inner (1st–4th), intermediate (5th–7th), and outer (8th–10th) leaves and all experimental material was then stored at 8 °C for 10 d. Maximum leaf extension and leaf-part extension were measured at the end of storage in the first and second experiments, respectively, while metabolic activity measured as CO_2 and C_2H_4 production was monitored during storage in the third experiment. Additionally, leaf material was sampled from the base and mid leaf area of an inner and an outer leaf for anatomical evaluation. The results showed that after 10 d storage at 8 °C of leek pseudostems with 10 leaves trimmed at 20 cm from the base, the inner four leaves were metabolically very active and had the highest leaf extension, which was restricted to the basal 0–8 cm leaf-part. This inner leaf-part constitutes the growth zone in trimmed leek stalks, where cell division and subsequent cell elongation occur, while the outer leaf tissues have already fully expanded.