EFFECTS OF DIFFERENT GROWING SYSTEMS ON STRAWBERRY “ELSANTA”

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Strawberry fruit (stands) are a highly perishable fresh produce. With duration of storage the incidence of postharvest diseases, mainly Grey Mould (*Botrytis cinerea* Fuck.), and the deterioration of quality components (such as firmness, colour, flavor, taste) increase. Usually strawberries are short term cold-stored (1-4°C). Given potential duration of storage period vary, they tolerate elevated CO$_2$ atmosphere. ‘Off-odours’ may occur as consequence of anaerobic metabolism under oxygen deprived conditions.

MATERIAL AND METHOD

Irrigation and content of nitrogen, phosphate, potassium was adjusted to the same level after determination and fertilizing. Fruits were harvested when fully ripe and sorted out and then transferred to cold storage (overnight) from a trial at the institute’s experimental garden (Vienna, Jedlersdorf) comparing different growing systems/subsystems on a Chernozem (e.g. different organic systems): Organic, conventional-integrated, zero option (no fertilizing, no chemicals). Growing systems are randomized arranged over 4 trial-blocks, 4 repetitions per growing-system (area per plot: 25 m²). The day after harvest strawberries were brought to the sensory laboratory* for sensory evaluation, (data not shown here) and the post-harvest laboratory Lednice (CZ) for storage trials: a) Regular atmosphere b) ozonized atmosphere (O$_3$) c) Ultra Low Oxygen Atmosphäre (ULO: 0,9% O$_2$/ 1% CO$_2$) (all trials in 4°C, 85-90% humidity). All trials were transferred to ‘Regular Atmosphere’ after 9 days. Analytical methods applied were a) Colour (CIE L*a*b*c; Minolta CR300) b) Texture (TEXAN 2000 Materialprüfmaschine) c) gas chromatography- (GC-FID; organic acids, mono-carbohydrates, Laboratory Equipment, Praha) d) HPLC (anthocyanines, organic acids, carbohydrates – data not shown here) e) Sensory analysis (untrained panel) f) a ‘holistic’ electrochemical determination of P-values.

RESULTS AND DISCUSSION
Fruits of strawberry-cultivar ‘Elsanta’ (*Fragaria ananassa* L.) derived from conventional-integrated, organic and low-input growing-systems were harvested, sorted out, stored and physically, chemically, sensory, holistically analyzed to determine quality-components, physiological response and consumers’ perception. Questions of scientific interest were: a) Can physiological responses to growing systems be detected and quantified b) Can a model of distinction of ‘fruit quality’ depending on growing system be set up c) Can a so called holistic approach contribute to quality measurement?

Whole fruits did not vary significantly in external quality components. Colour measurement could differentiate between organic and conventional only when applied to fruit-press-sap. Chemical constituents (acids, sugars) differed to some extent but not generally. Another influencing factor besides growing system has to be taken into account. Sensory analysis resulted in significant differences, but could not be repeated the following year. ULO promoted texture of fruits, O₃ die promoted glossy appearance, cold storage delayed senescence and did not induce accumulation of ethanol and acetaldehyde (‘Off-odours’). Storage potential was surprisingly high (>20 days) but fruits rapidly deteriorated after day 22 (postharvest diseases, physiological and textural decay). Modified atmosphere had strong impact on fruits’ physiology and quality. ULO and ozone treatments resulted in higher contents of ethanol and acetaldehyde and production of volatile organic compounds. Ozone treatment did not counteract pathogen attack at stages of progressed senescence.

Quality models distinguishing between crops from different growing systems could be established by trend but not in general.

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**BIBLIOGRAPHY**


