

# Dried fruit quality judging on different sweet cherry varieties grown in Hungary

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**Summary:** The modern consumer's habit needs new material to enrich biological complete human foods. The mueslis contain more and more part of dried fruit. The organic nutrition prefers fruit, grown in that area, where they will be consumed. Therefore we thought on cherries, because earlier, almost all kind of fruit, including cherries, were dried. First of all we collect all sweet cherry varieties grown in Hungary (by the National List), (Harsányi & Mády, 2005) than they were dried similar way to the dried plum. After a short storage the samples were judged, by different consumers. The aim was to know, which variety gives the best result, i.e. which variety is the most suitable to gather round for dried fruit. At the judging we used the methods, worked out by the National Institute for Agricultural Quality Control in Hungary. Our work shows orders, which varieties were the best, from different point of view. (e.g. colour, size; firmness of flesh, flavour, and total score). The best varieties by total score will be shown and characterised shortly (Apostol, 1996; *Beschreibende Sortenliste Steinobst* 1997; Brózik & Kállay, 2000; Tóth, 1997; Harsányi & Mády, 2005; Horváth, 2004; Tomcsányi, 1979).

**Key words:** fruit drying, quality parameters, flavour, flesh firmness, colour

## Introduction

Dried fruits are well known since ancient times. It was dried most often fruit, which were heavy yielding, rich in sugar content e.g. plum, grape, etc. Dried fruit is very advantageous, because it preserves almost all valuable ingredients of fruit, because of the low temperature of drying process. So such dried fruit were in winter very valuable nutrition resource. As well in Hungary there are hot summers, so some of fruit got dry "naturally" on trees sometimes. (Surányi, 1990) It was a custom to dry fruit on "twig-drier", or in baker's oven, after making bread, when the temperature decreased, or on other oven, or in special drier-pothole. On dry areas, at rainless weather fruit were taken on big flat baskets to dry on the sun. Later automatically were grown up small drier factories. (Solti & Bodnár, 2002).

Dried fruit from Hungary were well known and in demand everywhere in Europe because of their good flavour and quality. Almost every kind of fruit was dried, having enough sugar and could be dried by simple tools. From this time were known dried fruit from apple, sweet- and sour cherries, pear, plum and grape. Developing of production was disadvantageous to maintain high diversity of fruits. For a lot of reason, (economical, miss of human power, the strong seasonality of drying process, etc.) it remains mainly the plum only to the period of last turn of the century, and to this attached the apple, at 1960's.

Modern nutritional-philosophy, the organic feeding discovers again forgotten or abandoned dishes, nutritional customs (Klincsek & Szabó, 2002; Sirieix et al, 2002; Steen et al., 2002).

Organic nutrition use willingly dried fruit, mixed in muesli from different grains and seeds. These are besides raisin, dried apple, apple-flakes, dried apricot, mango, bananas, pine apple, and other. The commercial fruited-muesli is rich enough by this way, but does not suit the requirements of organic demands. The organic movement prefers in these muesli-mixes fruit grown on the same place where it will be consumed. Therefore, we thought to dry stone fruit grown in Hungary, e.g. sweet cherry varieties.

## Materials and methods

Collected samples (at Pölöske Fruit Variety Testing Station of National Institute for Agricultural Quality Control) coming in ripening order were weighted, washed and cleaned from stalks and bracts, leaves, etc. at least pitted by hand or with stoned tool. Stone and stalk were weighted apart. Cleaned and pitted fruit got into an electric dryer and dried at a temperature of 60 °C, during 6 hours. Each 2 hours samples were turned. At the end of the drying period, it was checked, if the samples are dry enough (Burits & Berki, 1984; Ginzburg, 1979). The dry and cooled (on a room temperature) samples got into paper-bags, and were stored at a cool and dry place. After 2-month storage, samples were tested by an evaluation committee. This consisted of representative elected consumers, who filled in a questionnaire, giving 1–5 scores for the different qualities. (Kodex, 1988) The data were evaluated by statistical methods used in agricultural experiments and worked out by a computer. (Sváb, 1973).

Table 1 Sweet cherry varieties( in increasing order by total score)

Varieties	Colour	Size	Firmness of flesh	Taste	Total score
Márki korai	3.1	2.4	2.7	2.2	10.45
Bigarreau Burlat	3.2	2.9	2.9	2.1	11.00
Rita <sup>2</sup>	3.1	3.0	3.0	2.2	11.31
Münchebergi	3.5	2.9	2.9	2.3	11.48
Sunburst	3.1	3.0	3.2	3.2	12.57
Germersdorfi 45	3.2	2.8	3.3	3.4	12.69
Hedelfingeni	3.2	3.3	3.3	3.4	13.12
Stella	3.6	2.9	3.6	3.5	13.57
Vera	4.1	3.5	3.2	2.9	13.69
Alex	3.4	3.2	3.5	3.9	14.05
Kordia	3.9	3.6	3.5	3.2	14.24
Katalin	3.8	3.9	3.9	3.7	15.36
Van	3.5	3.8	4.3	4.1	15.60
Germersdorfi 3	3.9	4.0	4.1	4.4	16.31
Szomolyai fekete	4.4	4.2	4.3	4.0	16.98
Solymári gömbölyü	4.5	4.4	4.3	4.0	17.17
Mean	3.6	3.4	3.5	3.3	13.85
SD 5%	0.6	0.6	0.5	0.6	1.89
CV %	26.9	27.3	25.2	29.5	22.48
Level of probability (%)	1.0	1.0	1.0	1.0	1.00

## Results

### Evaluation of color

The best quality of dried fruit were deep red, the colour was equable and a little or more shiny (i.e. 'Solymári gömbölyü', 'Szomolyai fekete', 'Vera', 'Kordia', 'Germersdorfi 3', and 'Katalin'). 'Varieties with blue-blackish ('Hedelfingeni') or with light red colour on dried fruit were refused i.e. 'Rita', 'Márki korai', 'Sunburst' (Table 1).

### Evaluating of appearance of dried fruit

Preferred was the big, (or relative big) size, and round fruit, as 'Solymári gömbölyü'. This characteristic includes the shining and the evenness of skin ('Germersdorfi 3'), also got higher score, than others, where crinkles of skin distributed in blotches. (at the most early ripening varieties 'Bigarreau Burlat', 'Münchebergi', 'Márki korai' etc.) Fruit pitted by tools has got better appearance ('Szomolyai fekete'), than those pitted by hand ('Germersdorfi 45'). The highest were evaluated 'Solymári gömbölyü' and for its big size, and 'Szomolyai fekete' for its elegance. Too small size varieties, as 'Márki korai', 'Münchebergi', or varieties having bad form (as 'Stella', 'Rita'), or having wrinkles in blotches on skin ('Sunburst') got a low score.

### Firmness of dried fruit

The good quality dried fruit is firm, but not too tough and not too soft. This characteristic depends on type of cherry

variety, but it will be influenced by ripening degree of the fruit too. The toughness and thickness of fruit-skin and the ratio of flesh to skin also will be judged here. Best ones are having thin skin, or during drier process it becomes thinner ('Szomolyai fekete', 'Solymári gömbölyü'), or good ratio of flesh to skin (i.e. with relatively thick flesh 'Germersdorfi 3', 'Katalin', 'Van'). The less valuable varieties are having disadvantageous flesh/skin ratio, ('Bigarreau Burlat'), or having relatively too tough skin, as 'Münchebergi', 'Márki korai', or their flesh is too thin, as 'Rita'.

### Taste

This characteristic is very subjective. In spite of divers taste of judge all of them could set a high value on varieties, having pleasant flavour, harmonised with the high sugar content (i.e. feeling of sweetie) a of fruit, in a thick flesh.. Highest were valued the "sweet cherries", in which the high sugar-content concentrated by dryer process, but it could not damp the good flavour of the fruit, and harmonized with it. Best was 'Germersdorfi 3', which variety is very popular and highly accepted in Hungary in all form (rough, canned fruit, or even frozen fruit). Very good flavoured were varieties yet: 'Van', 'Solymári gömbölyü', and 'Szomolyai fekete', the last two ones are old Hungarian varieties, selected from landrace. Varieties having slender flavour ('Márki korai'), or too thin flesh, where the flavour could not be tasted ('Münchebergi' 'Bigarreau Burlat) were judged as disadvantageous. When the dried fruit was not sweet enough, or during drying it lost much of flavour, have got less points too ('Rita').

### Total score

The suitability for drying given variety will be determined not by one or two characteristics, but the sum of more important characteristics. In case of our sweet cherry varieties (the first 5 ones) all have got relative good colour, good size, (however among varieties there are differences enough in these characteristics), good, or almost good firmness and excellent flavour. These were: 'Solymári gömbölyü', 'Szomolyai fekete', 'Germersdorfi 3', 'Van' and 'Katalin'.

Soft varieties, (during drying most of them got like paper) and varieties with shy flavour, or less sugar content, or with tough skin, and thin flesh were dismissed. Their sizes were mostly middle or small, their colour middle also; except variety 'Vera', which has a good colour, but it could not help to get good total score. These are not suitable to make dried fruit. These are: the most of early or very early ripening varieties (Table 5).

### Conclusion

Here the best 5 sweet cherry varieties will be shown:

**'SOLYMÁRI GÖMBÖLYÜ'** **Origin:** landrace, selected in Hungary (Buda growing quarter, nearby to the village Solymár, by Research Institute for Fruit-growing and Ornamentals to Érd (Res.Inst.for Fruitg.&Orn to Érd)) Since: 1968

**Fruit:** medium to large (about 6–7 g) a bit elongated - roundish. **Skin:** shiny deep red, tough. **Stalk:** medium sized; between stalk and fruit there is an abscission layer. **Flesh:** medium firm, sweet with a bit sour, rich in flavour, spicy.

**Growing value:** Self incompatible, its best pollinators: 'Germersdorfi 3', 'Hedelfingeni', 'Van'. It ripens: medium time, in Hungary mostly at mid June; a week before 'Germersdorfi 3'. It is suitable for fresh consumption as well as for almost all purposes.

**'SZOMOLYAI FEKETE'** **Origin:** landrace; selected in Hungary (at Mátra-Bükk Hill Region, nearby to the town Eger, from the old cultivar-type 'Egri fekete' by Res.Inst.for Fruitg.& Orn. to Érd.) Since: 1968.

**Fruit:** small to medium size (about 4–5 g) elongated globous. **Skin:** shiny deep blackish red, medium thick, but tough. **Stalk:** short. **Flesh:** medium firm to soft, juicy, deep red, dying; sweet, fine spicy rich at flavour. It is one of our best flavoured cherry varieties. Fruit comes away from stalk dry; so it is suitable to machine harvesting.

**Growing value:** self sterile; bearing early and heavy and regularly. It needs pollinator from other early flowering varieties, e.g. 'Bigarreau Burlat', 'Münchebergi', etc. and it gives good pollen to these too. Early to medium ripening time (the first 10 days of June in Hungary). Because of its high dry substance and deep red juice and excellent flavour, it is preferred by food-industry.

**'GERMERSDORFI 3'** **Origin:** Selected from the Germersdorfi variety-group in Hungary by Research Institute for Fruit-growing and Ornamentals to Érd; since: 1982.

**Fruit:** large, to very large size, (7–9 g) a bit flat -round shaped. **Skin:** medium red to deep red when ripe deep crimson. **Flesh:** very firm, has a good shipping quality. **Flesh** is light red, with high firmness, juicy, sweet-sour, rich in flavour, spicy. **Stalk** is of medium length.

**Growing value:** Ripens: medium-late time (last 10–12 days of June). To come bearing a bit late, but yields satisfactorily and regularly. Its tree is strong. Self-sterile, its best pollinators are: 'Solymári gömbölyü', 'Van', 'Sunburst', 'Hedelfingeni', etc. It is suitable for fresh consumption, and for almost all purpose. In Hungary will be highly accepted.

### 'VAN'

**Origin:** Seedling of open pollinated variety 'Empress Eugenie', in Agroicultural Research Station, Summerland, Canada; since 1944. (The variety was acclimatized In Hungary by Research Institute for Fruit-growing and Ornamentals to Érd. Since: 1976.)

**Fruit:** medium size, (4–7 g). **Skin:** deep brown-red, shiny. **Flesh** is firm, sweet-sour, rather sweet with good flavour.

**Growing value:** Ripens: at medium time (at the middle of June, or some days later). It is a heavy and regularly bearer, and hardy. **Stalk** is short. It is suitable for fresh consumption and for other food processing. Self incompatible; good pollinators for it: 'Bigarreau Burlat', 'Germersdorfi 3', 'Hedelfingeni', 'Katalin'.

**'KATALIN'** **Origin:** Hybrid, ('Germersdorfi' x 'Podjeb-rad') bred in Research Inst. for Fruit-growing & Ornamentals to Érd) since: 1989.

**Fruit:** large to very large (8–10 g), elongated round. **Skin:** shiny, deep, brown-red, a bit thick. **Flesh:** firm, sweet-sour, rather sweet, harmonious with good flavour. Juicy, their colours are deep red. Fruit comes away from the long stalk dry, so suitable to machine harvesting. **Growing value:** Ripens: at the end of June. It is a heavy, and regularly bearer, self-sterile. Good pollinators: 'Van', 'Stella', 'Linda', 'Alex', etc. Tree needs humidity, under dry conditions fruit remain smaller. It will be used especially for fresh consumption, but also for canning and for freezing.

**Stalk** dry, so it is suitable to machine harvesting.

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