

Raspberry Jams: Flavor and Texture Variation in a Selection of European Samples

K. Koppel (1), L. Timberg (2)

(1) *Kansas State University, Sensory Analysis Center, Manhattan, KS, USA*

(2) *Competence Center of Food and Fermentation Technologies, Tallinn, Estonia*

Introduction

Raspberry jams are well known for their delicate flavor in most European countries and the US. However a significant variation in quality can exist, which may be dependent on several factors. A selection of European raspberry jams was studied with the objectives of to 1) determine whether regional characteristics in flavor or texture properties exist, and 2) determine the main differentiating attributes among the samples.

Materials and Methods

The samples (n=21, Table 1) manufactured in 10 different countries were analyzed for their appearance (color, opaqueness, berry content), texture (thickness, granularity, seed hardness), flavor (sweet, sour, bitter, heated raspberry, astringent, barbariss, artificial, brown sweet), and mouthfeel attributes (velvety) using descriptive sensory analysis. The samples included jams manufactured with fructose (Spa1, Ger2), an organic sample (Den6), and a sample manufactured without seeds (Fra1). Sample Est3 was manufactured with raspberries and sucrose only. The attributes used were selected by trained panelists. The panelists evaluated the samples in triplicates. Correlations between sensory and instrumental measurements (pH, Brix, dry weight, color, hardness, acid and sugar content) were determined.

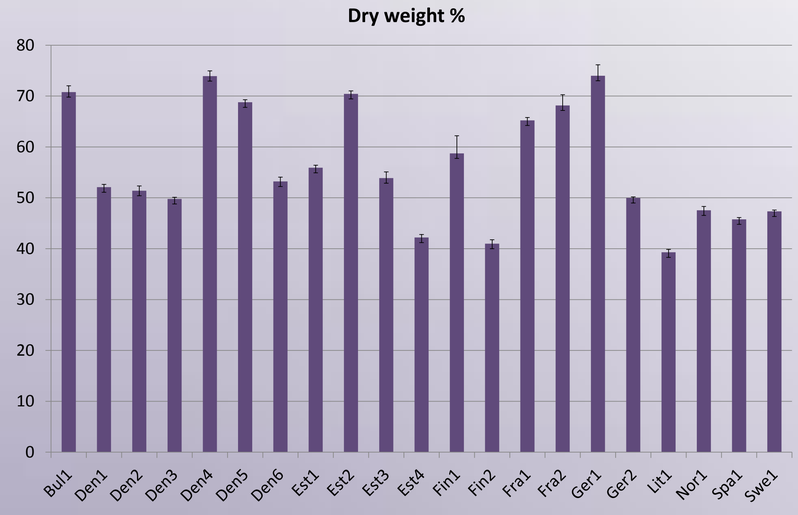

Figure 1. Dry weight (%) of samples. Error bars indicate standard deviation.

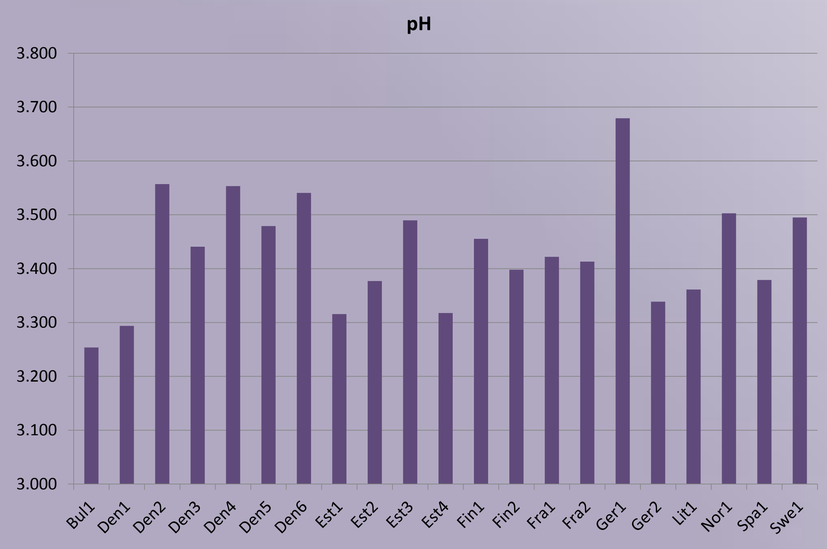

Figure 2. pH of samples. Standard deviation <0.1 units.

Table 1. Sample codes , berries and sugars content as given on the packaging.

Sample code	Berry content/ 100g	Sugars content/ 100g
Bul1	35	65
Den1	40	50
Den2	40	47
Den3	35	43
Den4	35	63
Den5	40	65
Den6	50	45
Est1	43	45
Est2	35	58
Est3	70	30
Est4	45	51
Fin1	40	46
Fin2	50	37
Fra1	55	60
Fra2	50	60
Ger1	50	63
Ger2	50	39
Lit1	35	55
Nor1	40	51
Spa1	60	40
Swe1	45	43

Results and Discussion

The results indicated no relationships between flavor or texture and country of manufacture, confirming similar findings of previous studies on strawberry jams (Koppel et al., 2011). The dry weight of the samples varied from 40-70% (Figure 1), while the pH of the products varied from 3.2-3.7 units (Figure 2). The differentiating attributes were sample color, heated raspberry (PC1, 32%), artificial (PC5, 6.8%), and barberry flavors (PC3, 13%), velvety mouthfeel and sweetness (PC2, 21%), and thickness (PC4, 11.%) (Figure 3). Correlations existed between sour taste and acids content (0.77) and sweet taste and sugars content (0.82). The sensory profile of some of the samples (red, heated raspberry flavor, sweet) suggests they may be more successful among consumers than others (brown, bitter, and astringent). The variation between the products is likely to be caused by the manufacturing technology, pretreatment and quality of the berries, or packaging material.

References

K. Koppel, L. Timberg, A. Salumets, T. Paalme. 2011. Possibility for a Strawberry Jam Sensory Standard. J Sensory Stud 26: 71-80.

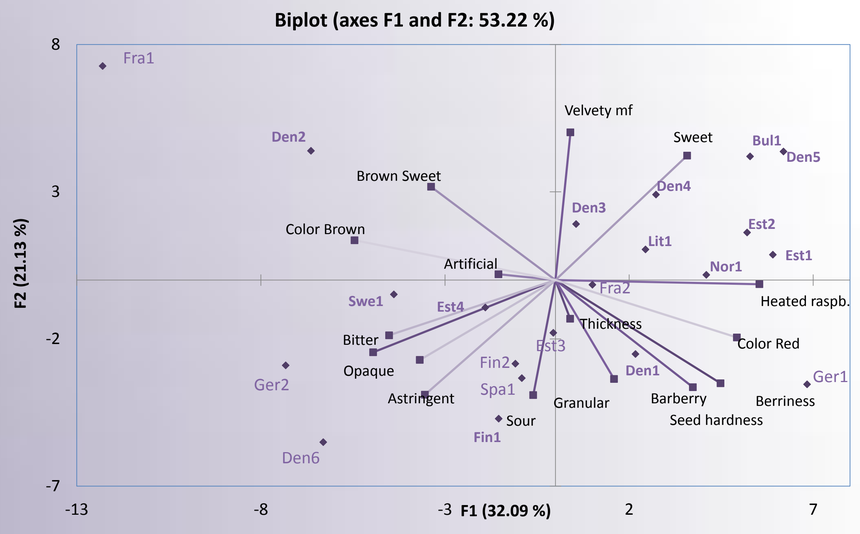

Figure 3. PCA biplot, PC1 and 2. Samples in bold – sugars content >50%, samples in italics – berry content >50%.

KANSAS STATE UNIVERSITY

Email: kadri@ksu.edu

Web: www.Sensoryanalysis.com

Sensory Analysis Center

Skillful Science. Savvy Solutions.