

THE EFFECT OF PUMPKIN SEEDS ADDITION ON THE CHARACTERISTICS OF CREAM CHEESE



Mirela Lučan Čolić*, Jovica Hardi, Lidija Dujmović, Marijana Tomljanović

Josip Juraj Strossmayer University of Osijek, Faculty of Food Technology Osijek, Franje Kuhača 18, 31000 Osijek, Croatia

*mlucan@ptfos.hr

INTRODUCTION

Pumpkin seeds contain various bio-active components that promote human health. Cream cheese is a very popular dairy product often enriched with various additives. The aim of this study was to determine the effects of different proportions (5 and 10 g/100 g), roasting level (light to dark) and grinding degree (fine to coarse) of added pumpkin seeds on the cheese spread quality.

MATERIAL AND METHODS

The cream cheese was produced according to standard specification from cream standardized to a fat content of 10 %. After fermentation process with mesophilic starter at 24 °C and separating the whey, cream cheese was mixed with pumpkin seed according to Table 1.

The colour of the samples was tested by spectrophotometric ($L^*a^*b^*$ colorimetric system), spreadability using a texture analyser, acceptability of the product using a hedonic scale, and the intensity of the individual property by the JAR test.

Table 1 Samples of cream cheese with pumpkin seeds

Sample	Roasting		Grinding		Pumpkin Seed (g/100 g)
	level	conditions	degree	conditions	
0	-	-	-	-	0
RC5	raw	-	coarse	5 s/5000 rpm	5
RC10	raw	-	coarse	5 s/5000 rpm	10
RM5	raw	-	medium	10 s/5000 rpm	5
RM10	raw	-	medium	10 s/5000 rpm	10
RF5	raw	-	fine	60 s/10000 rpm	5
RF10	raw	-	fine	60 s/10000 rpm	10
LC5	light	1 min/700 W	coarse	5 s/5000 rpm	5
LC10	light	1 min/700 W	coarse	5 s/5000 rpm	10
LM5	light	1 min/700 W	medium	10 s/5000 rpm	5
LM10	light	1 min/700 W	medium	10 s/5000 rpm	10
LF5	light	1 min/700 W	fine	60 s/10000 rpm	5
LF10	light	1 min/700 W	fine	60 s/10000 rpm	10
DC5	dark	1+1 min/700 W	coarse	5 s/5000 rpm	5
DC10	dark	1+1 min/700 W	coarse	5 s/5000 rpm	10
DM5	dark	1+1 min/700 W	medium	10 s/5000 rpm	5
DM10	dark	1+1 min/700 W	medium	10 s/5000 rpm	10
DF5	dark	1+1 min/700 W	fine	60 s/10000 rpm	5
DF10	dark	1+1 min/700 W	fine	60 s/10000 rpm	10

RESULTS

Table 2 Textural properties of cream cheese samples

Sample	Firmness (g)	Work of Shear (g s ⁻¹)	Stickiness (g)	Work of Adhesion (g s)
0	1975.36±386.15	1855.04±324.28	-1305.74±240.62	-109.35±0.96
RC5	1841.82±272.21	1625.39±143.84	-1165.63±77.24	-132.67±20.77
RC10	2158.16±231.30	1878.16±128.86	-1271.31±68.11	-144.05±6.48
RM5	1603.72±145.30	1573.35±170.84	-1155.70±116.90	-128.75±13.17
RM10	1750.15±186.83	1689.33±146.31	-1271.18±173.43	-158.15±5.54
RF5	1784.89±172.30	1823.33±160.08	-1396.27±151.31	-130.40±11.06
RF10	1558.50±166.93	1625.54±155.76	-1292.14±144.65	-159.83±15.41
LC5	1449.61±249.72	1426.07±180.26	-1019.01±127.10	-135.28±14.48
LC10	2020.94±189.34	2041.10±185.89	-1485.45±150.69	-136.05±10.42
LM5	1668.78±265.82	1708.34±253.95	-1211.87±227.13	-134.98±12.60
LM10	1550.31±154.78	1578.97±141.74	-1156.85±114.97	-153.53±26.41
LF5	1258.74±89.28	1298.06±68.39	-1012.80±67.72	-154.30±24.73
LF10	1358.01±15.84	1393.74±38.34	-1154.47±32.59	-177.89±24.70
DC5	1290.84±85.91	1301.44±71.84	-951.42±74.62	-143.47±11.35
DC10	1440.78±147.81	1427.90±134.75	-1025.31±152.37	-194.53±28.59
DM5	1153.33±54.34	1216.73±58.27	-900.85±52.08	-138.70±13.96
DM10	1422.11±48.63	1500.96±29.47	-1143.00±50.85	-161.03±24.38
DF5	1164.47±168.89	1189.74±164.56	-956.05±153.65	-151.35±6.86
DF10	1419.21±94.35	1468.50±128.61	-1193.53±78.40	-161.22±22.67

Figure 1 Hedonic ratings of overall acceptance for cream cheese samples

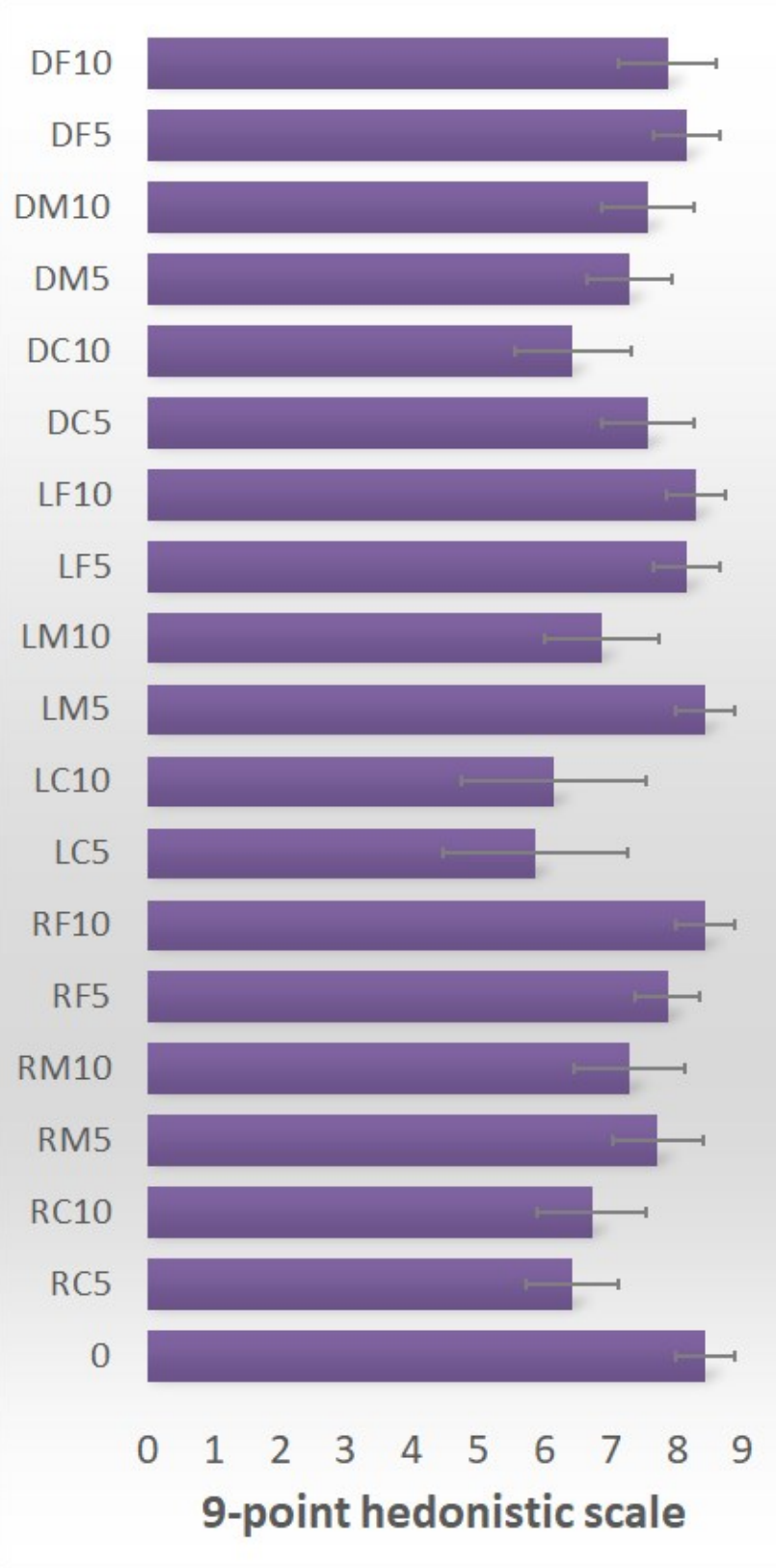
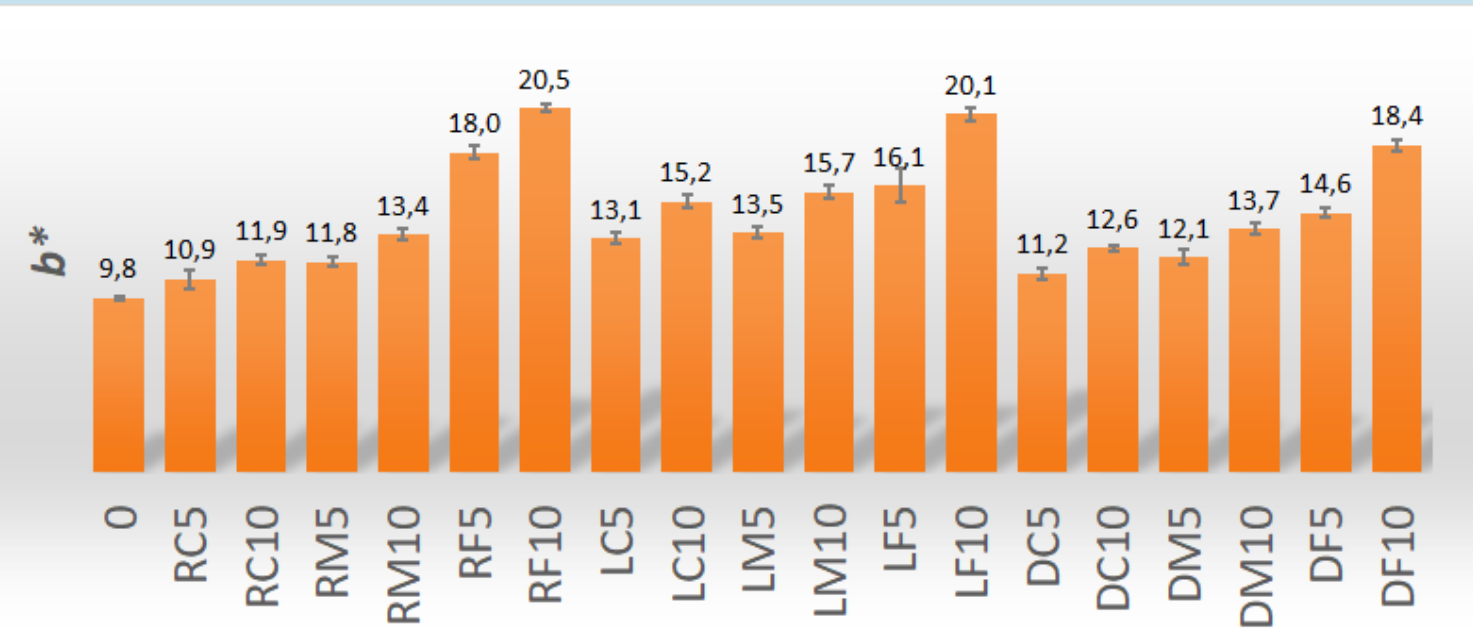
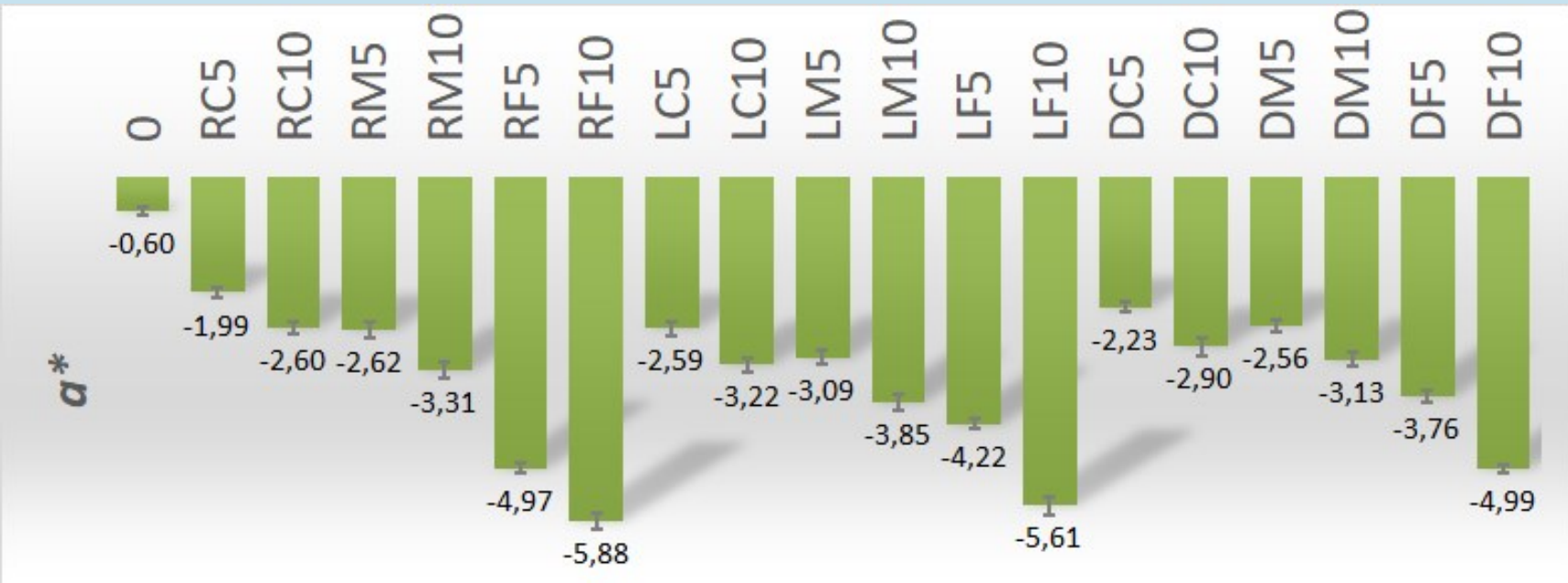
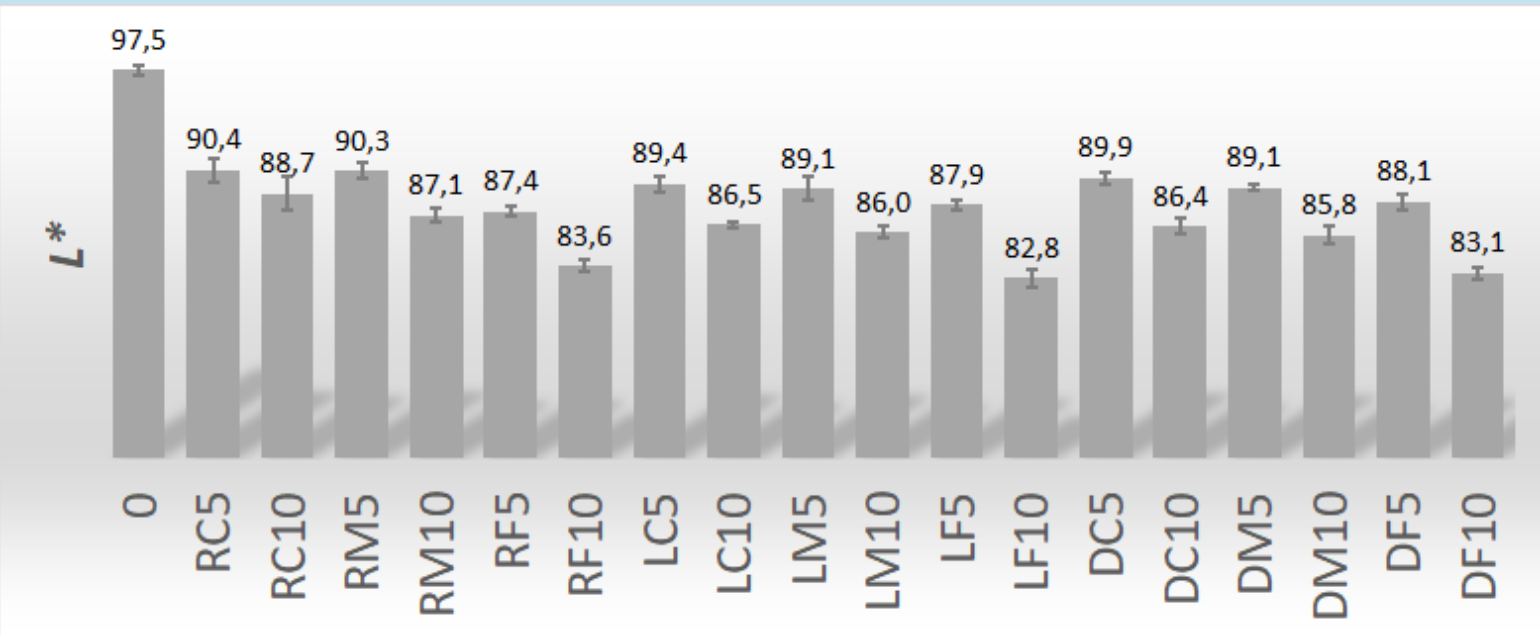


Table 3 Just-about-right (JAR) responses for intensity of sensory attributes of cream cheese samples

Sample	Colour	Flavour	Spreadability	Overall taste
0	0.05±0.10	-0.43±0.90	-0.10±0.10	-0.29±0.45
RC5	-0.14±0.69	0.00±1.15	-0.29±0.49	0.43±0.79
RC10	-0.14±0.74	0.00±1.15	-0.29±0.49	0.57±0.53
RM5	-0.14±0.69	-0.29±1.11	-0.29±0.49	0.00±0.82
RM10	0.14±0.18	0.14±1.11	-0.14±0.38	0.14±0.90
RF5	0.29±0.95	-0.14±1.21	0.29±0.49	-0.29±0.76
RF10	0.86±0.38	0.14±1.21	0.29±0.49	0.43±0.53
LC5	-0.14±0.49	-0.29±1.21	-0.29±0.95	0.29±1.11
LC10	-0.29±0.53	0.29±0.95	-0.29±0.49	0.86±0.69
LM5	-0.43±0.49	-0.43±1.11	0.01±0.10	0.00±0.58
LM10	0.29±0.66	-0.14±0.79	-0.14±0.38	0.71±0.76
LF5	0.14±0.76	-0.43±0.95	0.14±0.69	0.01±0.58
LF10	0.71±0.49	-0.29±0.82	0.14±0.69	0.43±0.98
DC5	0.29±0.00	0.00±0.58	0.14±0.49	0.43±0.53
DC10	0.00±0.58	0.00±0.76	-0.29±0.53	0.43±0.79
DM5	0.00±0.30	0.29±0.00	0.43±0.00	0.29±0.76
DM10	0.14±0.69	0.01±0.00	0.01±0.38	0.14±0.69
DF5	0.14±0.60	0.14±0.38	0.14±0.38	0.29±0.76
DF10	0.29±0.49	0.29±0.49	0.14±0.38	0.14±0.38

*Evaluated using a 5-point JAR scale (-2 = much to weak, -1 = too weak, 0 = JAR, +1 = too strong, +2 = much to strong)

Figure 2 Colour properties of cream cheese samples



Hunter color values (L^* - light to dark, a^* - red to green, and b^* - yellow to blue)

CONCLUSION

The roasting process significantly affected the instrumentally determined texture of the cheese spread: roasted pumpkin seeds reduced the firmness of the sample and thus increased the spreadability of the cream cheese. Samples with a higher proportion of pumpkin seeds that were finer ground showed a lower L^* colour value (darker) with stronger greenish and yellowish tones. Cheeses with a higher addition of pumpkin seeds with a higher degree of roasting, but a lower degree of grinding were rated as too intense in aroma and taste. Based on the results, cream cheese enriched with 10% finely ground raw pumpkin seeds and 5% light roasted medium ground pumpkin seeds showed good sensory acceptability comparable to that of the control sample.