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# **Study of chemical, physical and microbiological changes in date pastes and the determination of their proper conservation methods**

**Mohammed Alghannam; Essa Alorify and Razy Alamir  
National Centre for Palm Tree and Date Research, Al Hassa**

**Dates are one of the most important agriculture products in the Kingdom of Saudi Arabia. The harvested area is about 139,000 ha and the production increased from 318,000 MT in 1976 to 817,000 MT in 2002 (FAO Food and agriculture organization 2002).**

**In spite of this important development the date consumption in the kingdom is declining continuously and hence the average decreased from 39.3 kg/person/year during 1974- 1976 to 28.7 kg/person/year during 1993-1995 (Ministry of agriculture 1996- Economy of the date production in the Kingdom). According to this situation the overproduction is becoming more and more important and its processing is of a high necessity. The date pastes could be one of the most important date processing industries to absorb the excess of the date production mainly common dates and those of second grade. These pastes may be used at a large scale by the bakeries, as an alternative to industrial sugars, in order to produce different kind of cakes, pies and others.**

**However this industry is facing different problems such as the darkness of the date pasts, their hardness and their contamination by bacteria and fungi.**

**This research aims to study the effect of different treatments on the chemical, physical and microbiological characteristics of the date pastes.**

**The main conclusions are that the best paste's quality is obtained by soaking at 25 the date pastes during 5 minutes in a 0.5% Ascorbic acid solution. The temperature of 25C gives the final product a validity of use of 5 to 7 months.**

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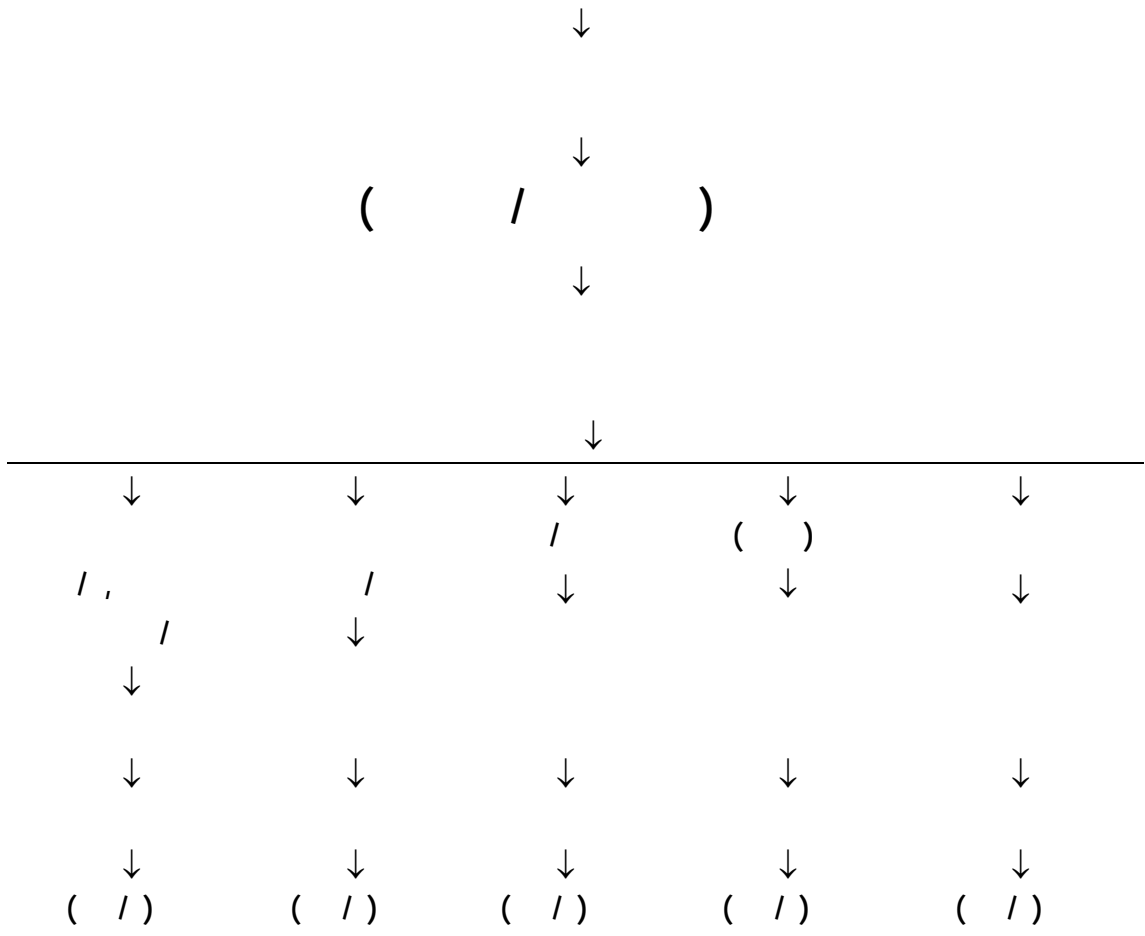
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**A<sub>w</sub> = 0.984+- 0.003**

**LiCl 13.41molal in H<sub>2</sub>O**

**A<sub>w</sub> = 0.250+-0.003**

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7	6	5	4	3	2	1	7	6	5	4	3	2	1		
5.44	5.41	5.48	5.31	5.23	5.28	5.3	0.38	0.47	0.42	0.42	0.4	0.45	0.44	0	5
5.40	5.43	5.41	5.40	5.34	5.34	5.34	0.30	0.23	0.3	0.29	0.26	0.22	0.30	1	
5.28	5.34	5.31	5.32	5.35	5.23	5.03	0.45	0.52	0.45	0.42	0.45	0.45	0.48	2	
5.13	5.21	5.07	5.23	5.19	5.18	5.13	0.52	0.45	0.50	0.50	0.43	0.46	0.44	3	
4.96	5.40	5.11	5.33	5.27	5.22	5.36	0.45	0.43	0.43	0.42	0.45	0.41	0.42	4	
5.38	5.39	5.34	5.37	5.37	5.45	5.64	0.46	0.48	0.56	0.58	0.58	0.47	0.46	5	
5.45	5.38	5.30	5.34	4.29	4.18	5.48	0.48	0.44	0.58	0.57	0.46	0.48	0.47	6	
4.34	4.48	4.28	4.42	4.34	4.15	4.48	0.50	0.49	0.59	0.62	0.56	0.51	0.46	7	
4.33	4.42	4.31	4.38	4.25	4.14	4.41	0.45	0.46	0.55	0.60	0.52	0.43	0.42	8	
4.35	4.41	4.25	4.36	4.26	4.16	4.29	0.43	0.46	0.47	0.62	0.59	0.43	0.43	9	
5.44	5.41	5.48	5.31	5.23	5.28	5.3	0.38	0.47	0.42	0.42	0.4	0.45	0.44	0	25
5.31	5.44	5.29	5.27	5.35	5.35	5.35	0.17	0.13	0.20	0.17	0.20	0.20	0.27	1	
5.36	5.36	5.40	5.38	5.34	5.33	5.39	0.55	0.55	0.50	0.55	0.47	0.55	0.47	2	
5.30	5.26	5.23	5.26	5.27	5.26	5.35	0.63	0.54	0.56	0.53	0.50	0.50	0.50	3	
5.08	5.09	5.03	5.20	5.15	5.97	5.22	0.48	0.50	0.48	0.47	0.50	0.46	0.43	4	
5.37	5.35	5.35	5.40	5.36	5.36	5.33	0.37	0.37	0.39	0.40	0.38	0.43	0.42	5	
5.36	5.33	5.25	5.26	5.23	5.38	5.42	0.38	0.38	0.39	0.40	0.39	0.44	0.43	6	
4.15	4.07	3.91	4.20	4.11	4.13	4.17	0.39	0.43	0.44	0.44	0.41	0.44	0.47	7	
4.23	4.23	4.22	4.27	4.24	4.27	4.32	0.38	0.43	0.48	0.48	0.47	0.42	0.45	8	
4.30	4.27	4.24	4.28	4.29	4.23	4.30	0.38	0.38	0.41	0.43	0.43	0.43	0.42	9	

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7	6	5	4	3	2	1		
0.50	0.51	0.53	0.53	0.51	0.54	0.41	0	。
0.78	0.47	0.56	0.54	0.57	0.48	0.48	1	
0.47	0.46	0.52	0.51	0.51	0.45	0.52	2	
0.49	0.47	0.54	0.55	0.56	0.53	0.46	3	
0.61	0.41	0.46	0.45	0.46	0.43	0.44	4	
0.41	0.40	0.49	0.48	0.52	0.44	0.44	5	
0.38	0.37	0.4	0.40	0.62	0.61	0.45	6	
0.43	0.34	0.46	0.46	0.49	0.46	0.41	7	
0.49	0.47	0.54	0.555	0.58	0.48	0.48	8	
0.51	0.48	0.71	0.55	0.58	0.47	0.51	9	
0.50	0.51	0.53	0.53	0.51	0.54	0.41	0	。
0.49	0.48	0.56	0.53	0.56	0.47	0.47	1	
0.44	0.42	0.45	0.45	0.50	0.41	0.43	2	
0.48	0.47	0.55	0.49	0.54	0.46	0.48	3	
0.46	0.42	0.48	0.46	0.55	0.46	0.45	4	
0.36	0.41	0.38	0.46	0.44	0.38	0.36	5	
0.38	0.37	0.41	0.42	0.43	0.42	0.46	6	
0.44	0.43	0.43	0.49	0.54	0.44	0.45	7	
0.52	0.53	0.50	0.52	0.56	0.45	0.48	8	
0.57	0.57	0.55	0.54	0.58	0.47	0.49	9	

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7	6	5	4	3	2	1	7	6	5	4	3	2	1		
1.42	3.37	6.82	6.72	6.9	2.42	1.77	0.405	0.39	0.47	0.38	0.49	0.45	0.48	0	5
2.07	3.15	3.17	3.2	2.87	2.17	1.27	0.43	0.43	0.43	0.42	0.41	0.44	0.43	1	
2.02	2.8	3.17	3.4	2.37	2.3	1.06	0.32	0.34	0.39	0.33	0.32	0.32	0.32	2	
5.53	3.93	5.38	5.33	6.26	2.03	2.23	0.38	0.37	0.41	0.48	0.43	0.45	0.44	3	
3.77	5.75	4.17	3.82	6.13	3.0	2.2	0.38	0.31	0.43	0.41	0.42	0.39	0.45	4	
3.71	5.77	4.16	3.8	6.4	2.5	2.42	0.36	0.40	0.45	0.44	0.44	0.34	0.34	5	
3.27	4.20	7.20	5.36	5.14	1.38	1.37	0.45	0.46	0.56	0.52	0.50	0.51	0.45	6	
4.20	4.63	6.95	5.90	6.17	1.87	2.27	0.44	0.38	0.45	0.42	0.44	0.41	0.42	7	
4.18	4.40	6.46	5.66	5.24	1.76	2.16	0.42	0.47	0.43	0.44	0.45	0.43	0.43	8	
4.43	4.90	5.61	6.66	7.13	1.73	2.2	0.43	0.42	0.57	0.45	0.45	0.43	0.43	9	
1.42	3.37	6.82	6.72	6.9	2.42	1.77	0.405	0.39	0.47	0.38	0.39	0.45	0.48	0	25
2.32	3.52	3.27	3.07	4.10	1.20	1.42	0.43	0.43	0.43	0.43	0.41	0.58	0.47	1	
2.72	3.57	2.2	3.32	3.92	2.17	1.52	0.36	0.38	0.47	0.29	0.33	0.32	0.34	2	
3.36	4.30	9.33	4.20	6.96	1.77	2.43	0.43	0.30	0.43	0.38	0.42	0.40	0.40	3	
4.87	5.5	7.1	6.13	6.13	5.47	2.00	0.39	0.48	0.44	0.41	0.43	0.41	0.41	4	
5.2	5.5	6.97	5.26	7.5	2.03	2.3	0.38	0.40	0.39	0.39	0.39	0.37	0.38	5	
5.83	4.46	11.3	6.17	6.96	2.07	1.61	0.57	0.61	0.68	0.56	0.57	0.54	0.48	6	
3.66	6.95	14.40	6.52	10.07	3.03	2.72	0.49	0.43	0.49	0.44	0.42	0.49	0.50	7	
3.30	6.43	13.86	6.10	10.40	3.00	2.96	0.45	0.43	0.45	0.43	0.45	0.47	0.49	8	
4.7	7.42	7.42	7.45	8.3	2.00	2.95	0.42	0.40	0.41	0.43	0.43	0.4	0.50	9	

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