

# Study of the sensitive parameters of Uruguayan type of honey

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1 - MELIKA S.A. - LATU - DINAPYME project 2006, 2 - CALAS - LATU - DINAPYME project 2006, 3 - MELIKA S.A., 4 - CALAS, 5 - DINAPYME, 6 - LATU - Technological Laboratory of Uruguay

**Introduction:** The purpose of this work was to know the tendency to the crystallization of honeys obtained by two beekeeper's companies CALAS and Melika S.A. This could be useful for the research of different technologies for packaging honey. Honey crystallizes because it is a saturated solution of sugars. The speed of crystallization depends on the source of flower, weather and others, which give a typical composition to the honey. This is associated to certain parameters known as **Sensitive parameters** : (%glucose, glucose/moisture, fructose/glucose, (glucose-moisture)/fructose) and to the **botanical origin**. These honeys come from hives of the north, west and south of Uruguay (Artigas, Salto, Soriano, Río Negro, Colonia, San José, Florida, Canelones).

**Methodology:** 34 samples of honey were sent to LATU from November 2006 to May 2007. Samples from Honey-comb-frame were extracted by press and filtered through a synthetic cloth. Crystallized samples were heated at 54°C until liquefied. Analysis performed at LATU Laboratorio Tecnológico del Uruguay: Moisture – by AOAC Official Methods of Analysis (2005) Method 969.38 Table 969.38 Glucose, Fructose – by HPLC A.O.A.C. Official Methods of Analysis (2005) Method 977.20 Mellisopalynology analysis (J. Loveaux, A. Maurizio, and G. Vorwhol) -

**Results:**

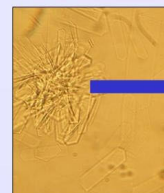
Sample	Scientific Name	Popular Name	G (g/100g)	G/M	F/G	(G-M)/F	Likely tendency to crystallize
01	Tipo Blepharocalix saleifolius	Arrayan (M)	28.4	1.7	1.4	0.3	Slow
02	Baccharis spp	Chirca (M)	34.7	1.8	1.1	0.4	Fast
03	Brassica napus	Coiza (M)	29.4	1.7	1.3	0.3	Slow
04	Citrus spp	Citrus (M)	33.6	1.7	1.2	0.3	Slow
05	Eucalyptus spp	Eucalpto (M)	31.1	1.6	1.1	0.3	Fast
06	Eucalyptus spp	Eucalpto (M)	27.2	1.6	1.2	0.3	Slow
07	Eucalyptus spp	Eucalpto (M)	33.5	1.7	1.1	0.4	Fast
08	Eucalyptus spp	Eucalpto (M)	29.4	1.8	1.3	0.3	Medium
09	Lotus spp	Lotus (M)	30.9	1.8	1.2	0.4	Medium
10	Lotus spp	Lotus (M)	30.2	1.8	1.3	0.3	Medium
11	Lotus spp	Lotus (M)	29.4	1.6	1.2	0.3	Slow
12	Lotus spp	Lotus (M)	34.9	2.1	1.1	0.5	Fast
13	Lotus spp	Lotus (M)	31.5	1.7	1.2	0.3	Slow
14	Lotus spp	Lotus (M)	30.9	1.7	1.2	0.3	Slow
15	Lotus spp	Lotus (M)	30.2	1.8	1.3	0.3	Medium
16	Lotus spp	Lotus (M)	31.0	1.6	1.2	0.3	Slow
17	Lotus spp	Lotus (M)	28.5	1.6	1.3	0.3	Slow
18	Lotus spp	Lotus (M)	29.3	1.6	1.3	0.3	Slow
19	Lotus spp	Lotus (M)	36.5	2.2	1.1	0.5	Fast
20	Lotus spp	Lotus (M)	29.2	1.6	1.3	0.3	Slow
21	Lotus spp	Lotus (M)	27.1	1.5	1.3	0.3	Slow
22	Lotus spp	Lotus (M)	27.2	1.5	1.3	0.2	Slow
23	Lotus spp	Lotus (M)	26.9	1.4	1.3	0.2	Slow
24	Lotus spp	Lotus (M)	31.3	1.9	1.3	0.4	Medium
25	Lotus spp	Lotus (M)	31.2	1.8	1.3	0.4	Medium
26	Lotus spp	Lotus (M)	32.1	2.1	1.3	0.4	Fast
27	Lotus spp	Lotus (M)	28.6	1.5	1.3	0.3	Slow
28	Tipo Blepharocalix saleifolius / Scutia buxifolia / Schinus longifolius / Otros	Arrayan / Coronilla / Muelle (Monte Nativo) (P)	29.7	1.8	1.4	0.3	Medium
29	Tipo Blepharocalix saleifolius / Scutia buxifolia / Schinus longifolius / Otros	Arrayan / Coronilla / Muelle (Monte Nativo) (P)	28.4	1.7	1.4	0.3	Medium
30	Tipo Blepharocalix saleifolius / Scutia buxifolia / Schinus longifolius / Otros	Arrayan / Coronilla / Muelle (Monte Nativo) (P)	31.1	1.6	1.1	0.3	Slow
31	Scutia buxifolia / Eucalyptus spp / Tipo Blepharocalix saleifolius	Coronilla / Arrayan (Monte Nativo) (P)	32.3	2.1	1.2	0.4	Fast
32	Echium plantagineum / Tipo Schinus longifolius	Borraja / Tipo Muelle (P)	31.2	1.9	1.3	0.4	Fast
33	Eucalyptus spp / Malus spp	Eucalpto / Manzano (P)	28.1	1.7	1.4	0.3	Slow
34	Honeydew Honey	Honeydew Honey	20.4	1.6	1.1	0.4	Fast

Likely tendency to crystallize	G (g/100 g)	G/M	(G-M)/F	F / G
Fast	> 38	≥ 2.1	> 0.50	< 1.1
Medium	N/C	1.8-2.0	N/C	N/C
Slow	< 30	≤ 1.7	< 0.20	N/C

G = Glucose (g/100 g)  
 M = Moisture (g/100 g),  
 F = Fructose (g/100 g)  
 N/C = Not conclusive

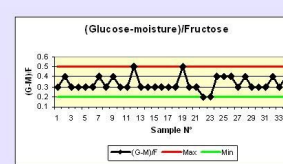
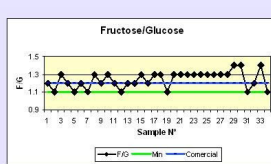
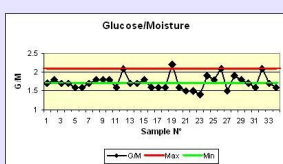
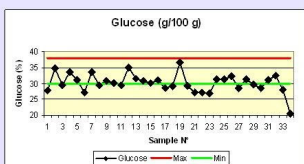
F/G (Commercial requirements) ≥ 1.2

Final crystallization :  
 Fast = less than 1 month  
 Medium = from 1 to 12 months  
 Slow = More than 1 year



Sugar Crystals in Honey

(M) = Monoflora (P) = Polyflora



**Discussion:**

The main honeys collected by this beekeeper's companies were monofloral, Lotus and Eucalyptus honey were the most frequent. One of the reasons for this, was that 68% of the samples came as comb honey framed. It is possible to produce monofloral honey with a proper beekeeper management. Uruguayan natural bush honey can be obtained in certain geographical areas. It is an original type of honey that can be produced by the bees along river banks and mountain range. Most of the samples of honey sent by the beekeepers presented a low tendency to crystallize (47%) These honeys could be suitable for packaging as fluid honey. The most representative of this group is the Lotus honey. Those which present a fast tendency to crystallize could be used to prepare cream honey. According to beekeepers' experience, lotus, citrus and natural bush honey present a slow to medium tendency to crystallize. This was confirmed by the analytical results. On the other hand, according to the beekeepers experiences, the Eucalyptus honey presents a fast tendency to crystallize. Analytical results did not show this tendency in an absolute way. According to international references these **Sensitive Parameters** can be used as a guide but they are not conclusive. Finally, it is recommended to take into account beekeepers experience, analytical results and an appropriate in vitro assay.



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