Supplementary Material

S. Table 1: Freeze drying protocol.

	Loading	**Freezing**	**Primary drying**			**Secondary drying**		
	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8
Time (hr: min)		1	00:15	00:30	12:00	00:30	08:00	04:00
Shelf temp. (°C)	-40	-40	-35	-10	-10	-10	20	20
Pressure (mbar)			0.102	0.102	0.102	0.0100	0.0100	0.0100

S. Table 2: Dry weight of samples after freeze drying.

Sample	**Sucrose (g)**	**Glucose (g)**
Directly frozen (DF)	0.164	0.146
Room temperature overnight (RT)	0.133	0.140

S. Table 3: ^{1}H and ^{13}C NMR chemical shifts (δ, ppm) for the resonances from the α-glucan in the sucrose-RT and glucose-RT samples

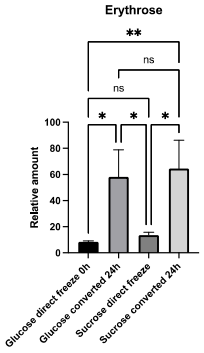
	H1/C1	H2/C2	H3/C3	H4/C4	H5/C5	H67C6
→ 4)- α-D-Glc	5,34, 5.33, 5.30 102.5	3.59 74.2	4.05 75.9	3.65 80.3	3.98 72.5	3.72. 3.84* 63.6
→ 6)- α-D-Glc	(a)4.95, 4.94 (b)4.94, 4.95, 4,96	3.56 74.4	3.73 76.2	3.45 c	3.89 c	c

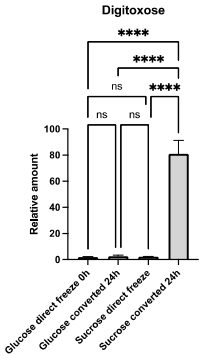
Lyoconversion of freeze-drying protectant

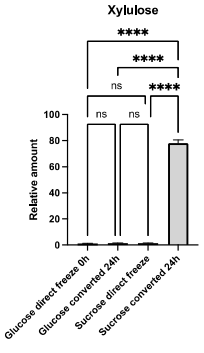
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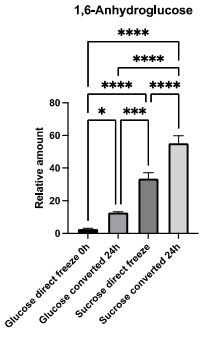
(a) ^{1}H chemical shifts of anomeric protons in the sucrose-RT sample
(b) ^{1}H chemical shifts of anomeric protons in the glucose-RT sample
(c) Not assigned unambiguously

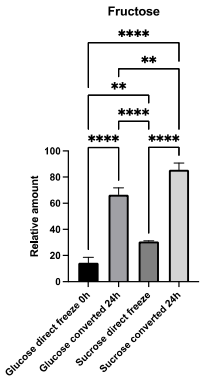
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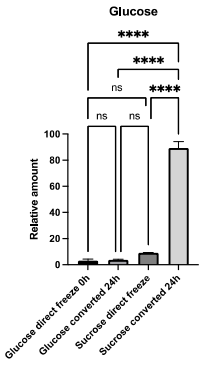


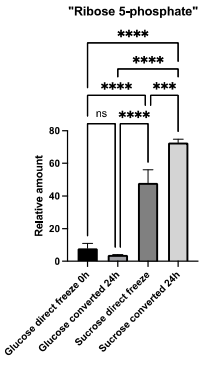


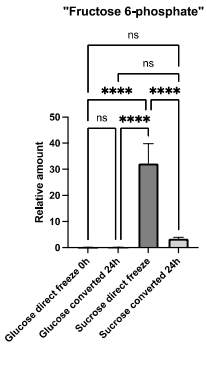


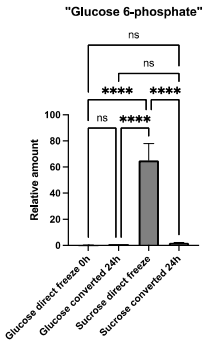


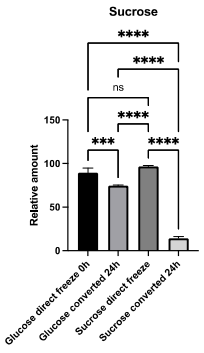


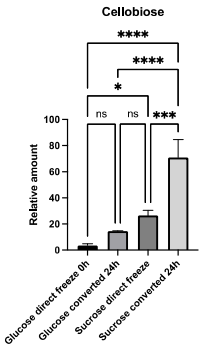


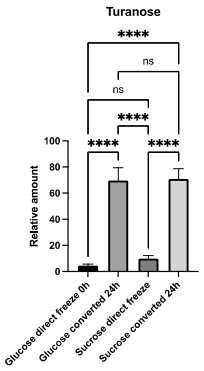


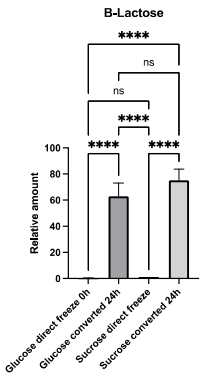


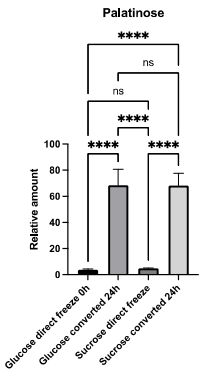


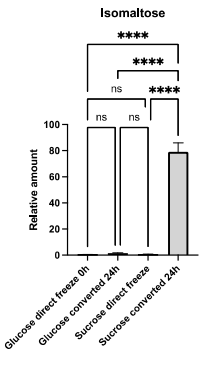


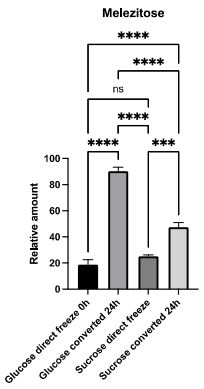






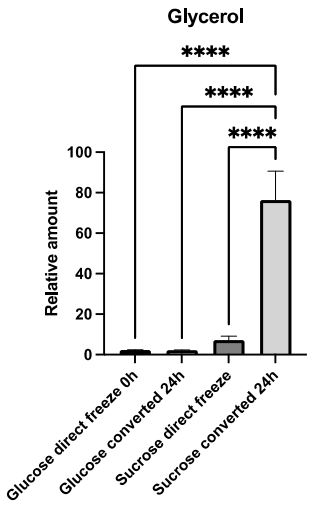


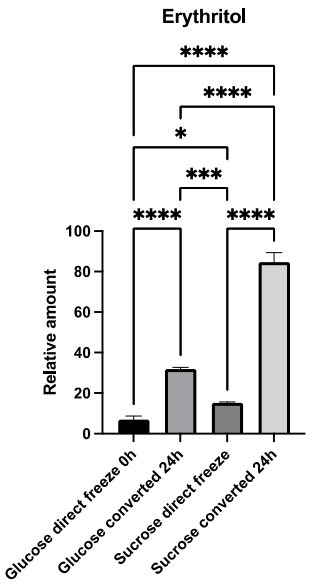


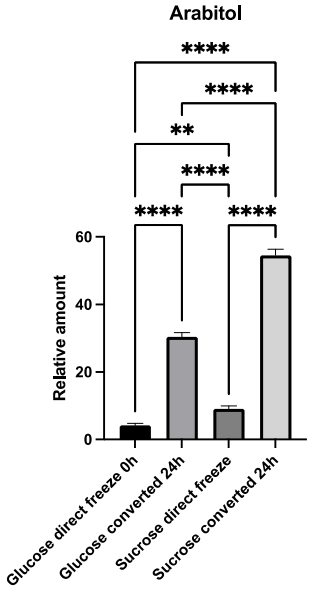


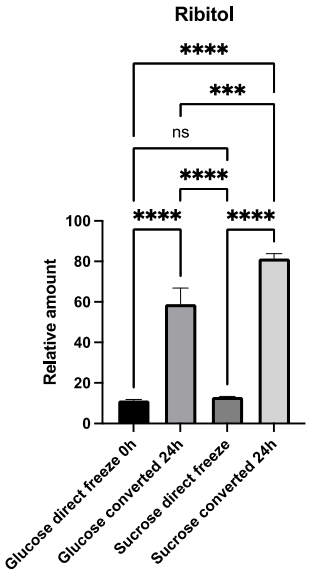
Supplementary Figure 1: Sugars detected by GCMS in the four types of samples. Values are relative, statistical analysis by One-Way ANOVA with Tukey's multiple comparisons test. N=3. Significance levels used were * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, **** $p < 0.0001$, ns $P > 0.05$. Prism GraphPad version 9.0 was used for the statistical analyses.

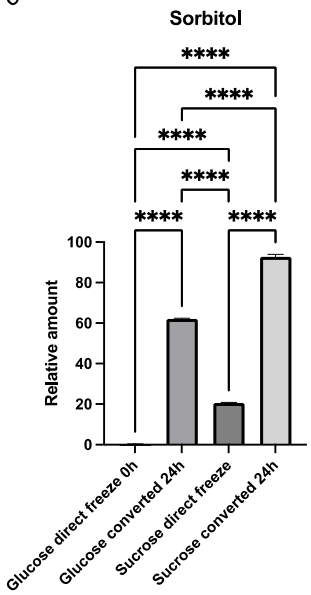
Lyoconversion of freeze-drying protectant

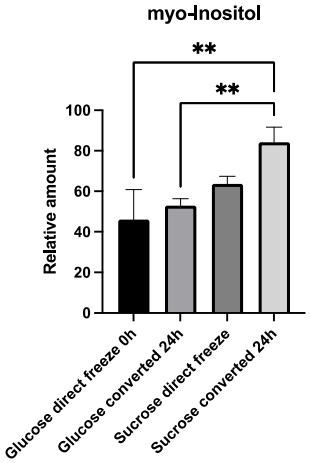






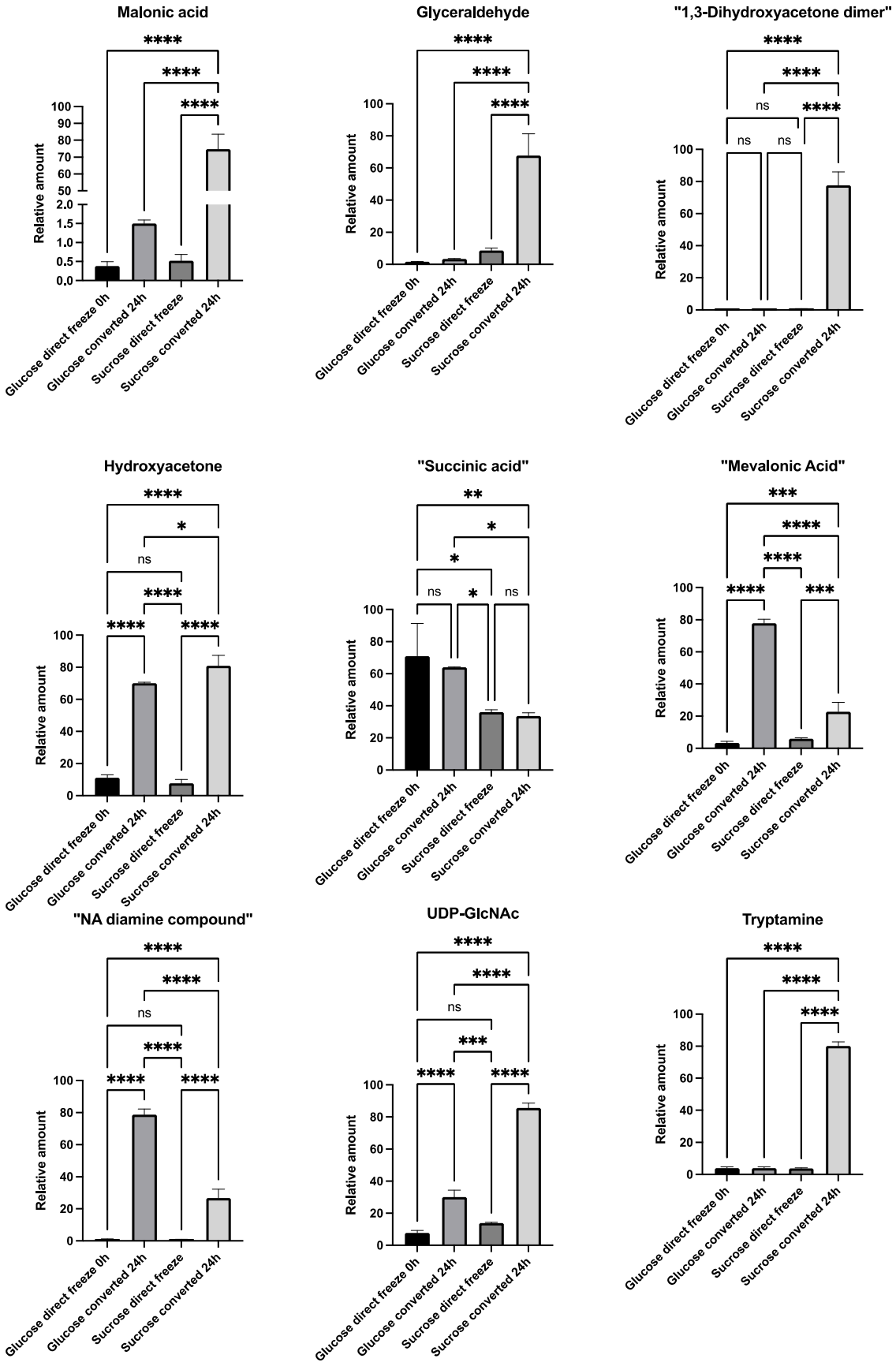






Supplementary Figure 2 Sugar alcohols detected by GCMS in the four different samples. Values are relative, statistical analysis by One-Way ANOVA with Tukey's multiple comparisons test. N=3. Significance levels used were * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, **** $p < 0.0001$, ns $P > 0.05$. Prism GraphPad version 9.0 was used for the statistical analyses.

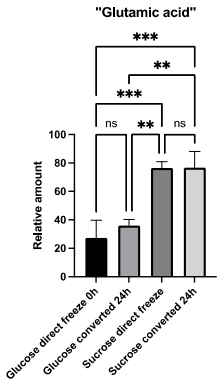
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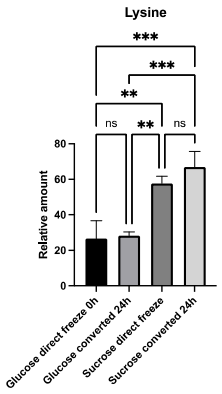


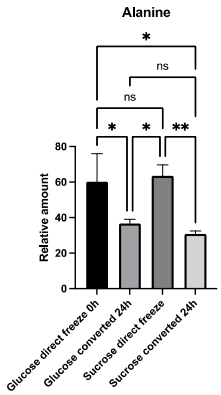
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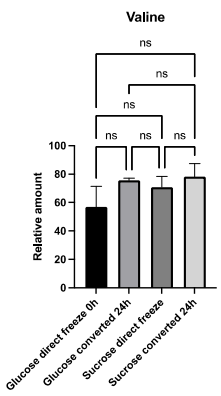
Supplementary Figure 3: Metabolites (not sugar, sugar alcohols or amino acids) detected by GCMS in the four different samples. Values are relative, statistical analysis by One-Way ANOVA with Tukey's multiple comparisons test. N=3. Significance levels used were * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, **** $p < 0.0001$, ns $P > 0.05$. Prism GraphPad version 9.0 was used for the statistical analyses.

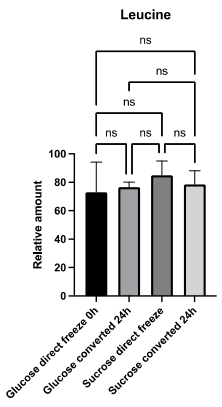
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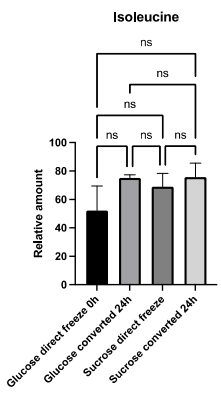


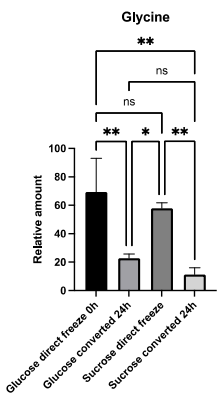


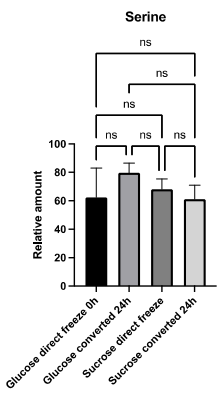


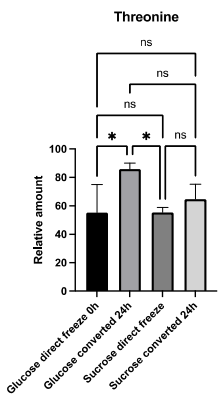


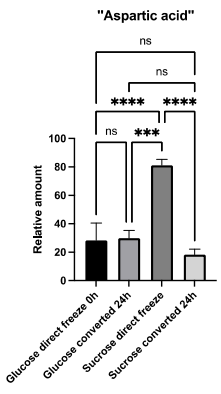


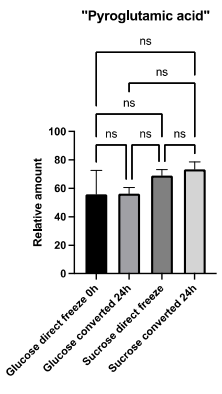


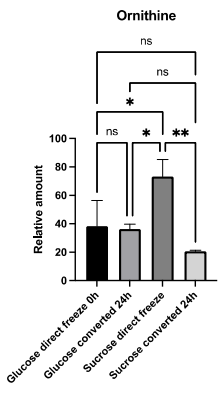












Supplementary Figure 4: Amino acids detected by GCMS in the four different samples. Values are relative, statistical analysis by One-Way ANOVA with Tukey's multiple comparisons test. N=3. Significance levels used were * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, **** $p < 0.0001$, ns $P > 0.05$. Prism GraphPad version 9.0 was used for the statistical analyses.