

THE INGREDIENT HOUSE

TECHNICAL REPORT

CULTURED DEXTROSE IN BAKING

TECHNICAL REPORT - 2020



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The Differing Effects of Calcium Propionate and AiBi® 1.50 Cultured Dextrose on Microbial Growth in Bread

Objective:

The purpose of this testing is to determine the effects that the natural preservative, AiBi® 1.50 Cultured Dextrose has on the shelf life of bread in comparison to bread with the artificial preservative Calcium Propionate.

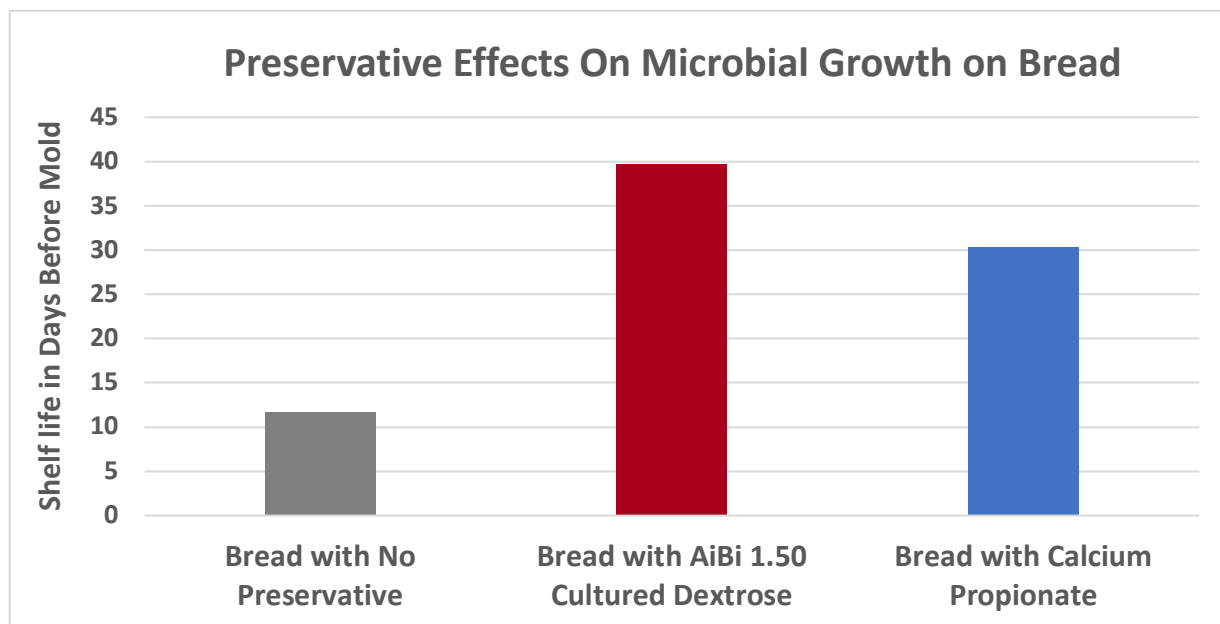
Packaging and Storage:

Once bread was prepared, it was placed inside a Ziploc bag, closed, and left on top of a counter at ambient temperature.

Outcome:

From the study, the results show that AiBi 1.50 Cultured Dextrose used at 0.5% was a more effective ingredient for shelf life extension than Calcium Propionate. Our AiBi 1.50 Cultured Dextrose used at 0.5%, allowed the white bread samples to last an average of 40 days before showing visual signs of mold and spoilage. In comparison, the white bread that contained calcium propionate lasted an average of 30 days before showing visual signs of mold growth.

Results:



Rep	Day that Visual Microbial Growth began in Bread Loaves		
	Bread with No CD	Bread with AiBi 1.50 Cultured Dextrose	Bread with Calcium Propionate
1	14	42	28
2	7	35	35
3	14	42	28
Average	11.67	39.67	30.33

Water Activity of Bread Samples

Day	Bread with Cultured Dextrose	Bread with Calcium Propionate
1	0.898	0.893
7	0.903	0.891
14	0.889	0.883
21	0.884	0.885
28	0.892	0.915
35	0.909	0.918
42	0.920	

Conclusions:

Using this research, we can conclude that our AiBi 1.50 Cultured Dextrose is a reasonable substitution for the artificial preservative Calcium Propionate. With a dosage of 0.5%, it is possible to reach an extended shelf life of up to 40 days using AiBi 1.50 Cultured Dextrose. While also extending shelf life by inhibiting yeast and mold growth, using Cultured Dextrose can help create a cleaner and more natural ingredient label.

Formulations:

White Bread with AiBi 1.50 Cultured Dextrose

Ingredient	Amount	Percent (w/w)
Instant Yeast	8.80	0.84
Warm Water	358.75	34.16
Granulated Sugar	30.00	2.86
Salt	8.53	0.81
Unsalted Butter	21.30	2.03
All-purpose Flour	617.50	58.80
<i>AiBi 1.50 Cultured Dextrose</i>	5.22	0.50
Total	1050.10 g	100.00%

1. In the bowl of a mixer, combine 78.75g warm water and yeast and let sit for five minutes.
2. Add the remaining 280.00g water, sugar, salt, butter, ***AiBi 1.50 Cultured Dextrose*** and 325.0g of flour. Using a dough hook, mix on low speed.
3. Gradually add the remaining flour until the dough is soft and tacky, but not sticky.
4. Continue to knead for about 7 to 10 minutes, until a soft dough ball forms.
5. Place the dough in a lightly greased bowl, cover with plastic wrap and set it to rise until doubled in size, about 45 minutes to 1 hour.
6. Turn the dough out onto a clean, floured surface. Gently press it all over to remove air pockets and pat into a 9x12 inch rectangle.
7. Roll up the rectangle, starting on the short end, into a very tight cylinder. Pinch to seal the seams and the ends, tuck the ends of the roll into the bread, and place into a greased 9inch loaf pan.
8. Cover the loaf loosely and let sit until doubled in size, after about 30-45 minutes.
9. Position an oven rack on the lowest setting and preheat the oven to 400°F.
10. Brush the loaf with melted butter and bake the loaf for 30-35 minutes, rotating halfway through until golden brown. A thermometer inserted into the center should read 195°F.
11. Remove from the oven and immediately brush with more melted butter. Allow it to cool for 10 minutes before removing the loaf from the pan.

White Bread with Calcium Propionate:

Ingredient	Amount	Percent (w/w)
Instant Yeast	8.80	0.84
Warm Water	358.75	34.23
Granulated Sugar	30.00	2.86
Salt	8.53	0.81
Unsalted Butter	21.30	2.03
All-purpose Flour	617.50	58.92
Calcium Propionate	3.09	0.29
Total	1047.97 g	100.00%

Production

1. In the bowl of a mixer, combine 78.75g warm water and yeast and let sit for five minutes.
2. Add the remaining 280.00 water, sugar, salt, butter, calcium propionate and 325.0g of flour. Using a dough hook, mix on low speed.
3. Gradually add the remaining flour until the dough is soft and tacky, but not sticky.
4. Continue to knead for about 7 to 10 minutes, until a soft dough ball forms.
5. Place the dough in a lightly greased bowl, cover with plastic wrap and set it to rise until doubled in size, about 45 minutes to 1 hour.
6. Turn the dough out onto a clean, floured surface. Gently press it all over to remove air pockets and pat into a 9x12 inch rectangle.
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