CORRECTION OF FLOURS WITH ALPHA-AMILASE DEFICIT TAKING INTO ACCOUNT DOUGH'S DEMAGE

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Abstract

It is known that at the temperature of 30-32°C, the met feather shot is hydrates and it bloats. In this cases, only α-amilase can produces an starch hydrolyse. When we speak about starch hydrolyse we have to say that the facts which influence this process are: rate of damage starch and the amount of α-amilase. Most important is rate of damage who depends of wheat, technological flux and the way to regulation the rollers.
Keywords : *α-amilase, damage, starch, optimum values, bread's quality.*

Introduction

It is known that at the temperature of 30-32°C, the met feather shot is hydrates and it bloats. In this cases, only α-amilase can produces an starch hydrolyse. When we speak about starch hydrolyse we have to say that the facts which influence this process are: rate of damage starch and the amount of α-amilase. Most important is rate of damage who depends of wheat, technological flux and the way to regulation the rollers. For obtain a good quality of bread it exist an optimum value of damage starch because when it is hydrate, water penetrate specially in cracked zone of starch's met feather shot.In this paper we try to find correlation between damage rate of starch, exogen addition of α-amilase and bread's quality.

Experimental

Our's determinations has two points of view (with one single denominator):

- analysis of correlation between damage rate of starch and bread's quality. In this case we used three tipes of flour 650:*flour with strong quality; flour with medium quality and flour with soft quality.*
- analysis of correlation between damage rate of starch and exogen addition of α-amilase. For this determination we used five samples of flour 650 with the same quality, all with α-amilase deficit but with different rate of damage starch.

Results and Discussions

Regarding correlation between damage rate of starch and bread's quality we have to say that our three samples have different phisical-chimical properties (table no. 1). We realize that the rate of damage starch increases once with decrease of bread's quality and the speed of iod absorbtion increases because the rate of damage starch is bigger.

Table 1: Phisical-chimical properties of our samples

Bread's quality	Protein, %	Clammy gluten, %	Deformation number, mm	Falling number sec	Damage rate of starch, UCD	Speed of iod absorbtion, %
Strong	12.8	33.6	4	415	22.6	33
Medium	11	25.8	6	395	24.6	30
Soft	10.1	21.1	17	372	25.4	26

For correlation between damage rate of starch and exogen addition of α-amilase we used like samples five tipes of flour with the following phisical-chimical properties:

Table 2: Phisical-chimical properties of our samples

Sample	Protein %	Clammy gluten, %	Deformation number, mm	Falling number sec	Damage rate of starch, UCD	Speed of iod absorbtion %
P1	11.8	27.5	5	389	26.1	27
P2	11.3	27	5	401	25.3	27
P3	11.5	27.4	5	394	24.0	31
P4	11.2	27	5	390	22.5	33
P5	11.4	27.1	5	388	20.3	35

For regulate the α-amilase deficit we have added 2, 3 and 4 g exogen α-amilase per 100 Kg flour and after we analyses it rheological. Our results are presented in table number 3:

Table 3: Phisical-chimical properties of our samples

Sample	UCD	IC sec	CH %	B, min	CD min	E U.B.	V	P, mmHO	L mm	W 10E-4J	P/L
1	2	3	4	5	6	7	8	9	10	11	12
P1	26.2	389	58	2.2	3.30	100	49	43	92	150	0.46
P1. 2 g	28.9	297	58.5	1.44	3.20	110	45	34	82	124	0.40
P1. 3 g	29.9	235	59.2	1.32	3	125	40	35	97	104	0.36
P1. 4 g	30.3	198	60.1	1	2.30	140	35	36	127	74	0.25
P2	25.4	402	57.4	2.42	4.50	80	65	62	114	205	0.54
P2. 2 g	25.7	327	58	2.30	4.2	90	58	60	117	193	0.51
P2. 3 g	26.0	285	58.4	2.30	4	94	55	52	120	165	0.43
P2. 4 g	26.2	248	59.1	2.15	3.44	100	50	48	128	139	0.36

1	2	3	4	5	6	7	8	9	10	11	12
P3	24.1	396	57.6	3	4.38	60	60	60	108	218	0.55
P3. 2 g	24.6	333	58	2.45	4.30	60	58	56	112	212	0.50
P3. 3 g	25.1	287	58.2	2.45	4.20	74	57	56	118	193	0.46
P3. 4 g	25.5	240	59	2.30	4	80	56	50	121	167	0.41
P4	22.6	391	58.1	3.14	6.30	45	74	100	70	267	1.43
P4. 2 g	23.1	332	58.3	3	6	50	64	85	93	276	0.91
P4. 3 g	23.2	298	58.4	3	5.40	50	60	70	101	315	0.69
P4. 4 g	23.6	265	59	2.42	5.10	54	60	64	105	268	0.61
P5	20.4	388	57.6	4	9.10	50	80	85	86	303	0.97
P5. 2 g	21.1	323	58	4.18	8.50	54	74	81	94	275	0.84
P5. 3 g	24.5	298	58.1	3.12	8.28	60	73	70	100	275	0.66
P5. 4 g	22.8	275	58.5	3.12	8	64	70	68	107	250	0.61

Legend :

UCD - Damage rate of starch; IC - Falling number; CH - Hydration capacity; B - Time of dough's development; CD - Dough's stability;

E - Dough's steeping; V - Strength flour; P – Viscozity; L – Extensibility; W - Baking intensity; P/L – Configuration's curve.

Conclusions

Starch deterioration is very important in bakery. It affect decisive the flatulence forming operation because β-amilase hydrolyses only met feather shot of damage starch. Our determinations made as to say following conclusions:

- ❖ When the amount of damage starch is bigger, the amount of α-amilase is smallest;
- ❖ Is very important to know rate of damage starch for millers and for bakers, specially when the flour have un deficit of α-amilase;

Using SDmatic machine from Chopin we could made in only ten minutes : determination of damage rate starch in flour, in UCD (Chopin Dubois units) and determination of iod absorbtion speed which helps us to determine wheat hardness.

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