Troubleshooting Cakes and Icings

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Troubleshooting Cakes and Icings

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Troubleshooting Cakes Requires Three Measurements

- Temperature
  - Batter
  - Oven
- Specific gravity
- pH

Score Sheet

DATE: _____

CAKE EVALUATION

TYPE: _____ PROJECT: _____

SCALING WEIGHT: _____ PAN TYPE: _____

EXPERIMENTAL VARIABLE: _____

_____

_____

CAKE SCORES

Cake		PRODUCTION IDENTIFICATION				
Qualities	Max. Score					
EXTERNAL:	30					
Volume	10					
Symmetry	5					
Crust Color	10					
Character of Crust	5					
REMARKS:						
INTERNAL:	70					
Grain	10					
Texture	15					
Crumb Color	10					
Aroma	10					
Taste	15					
Mouth Feel	10					
REMARKS:						
Specific Volume						
TOTAL SCORE	100					

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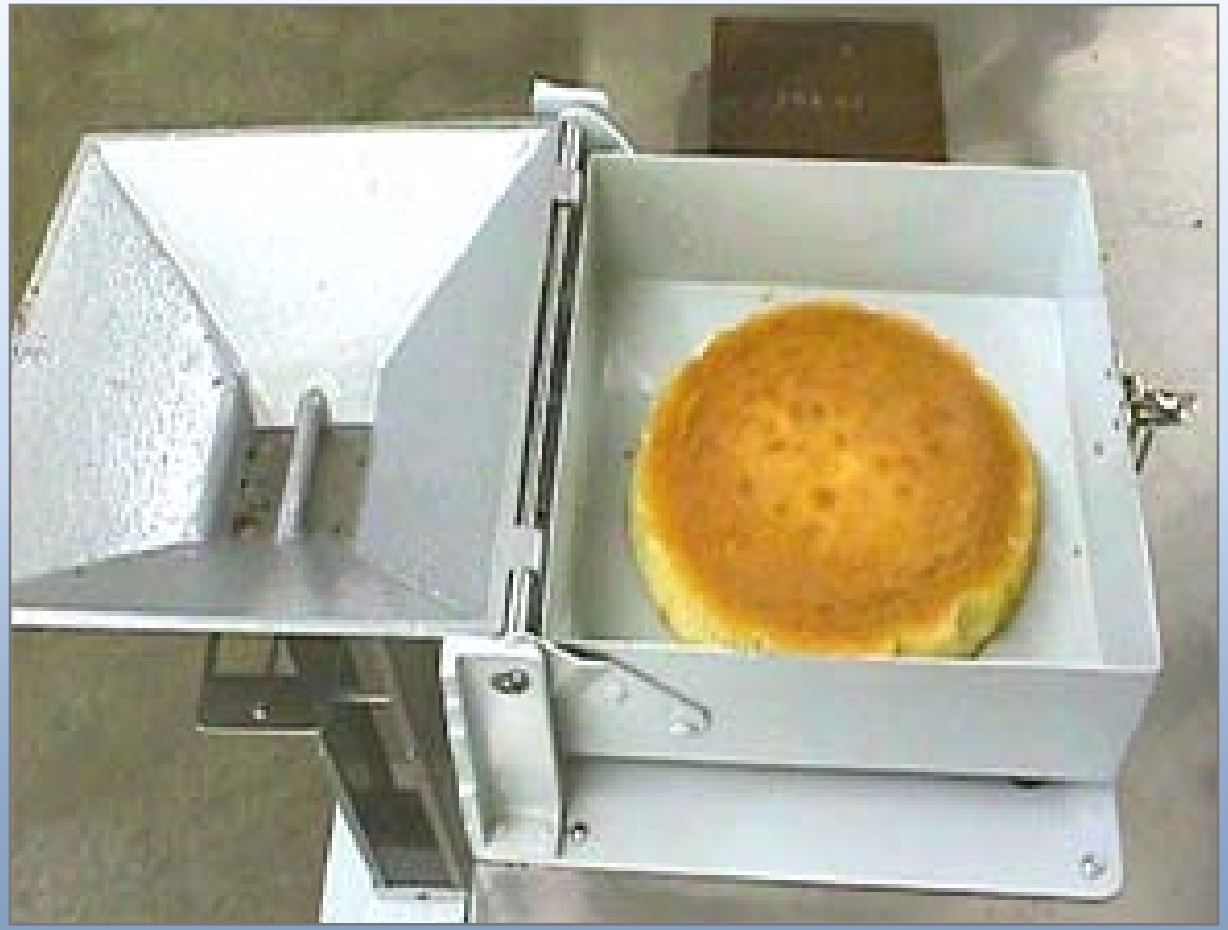
External Characteristics

- Volume: too big or too small
- Color of Crust: good - lively, uniform, free from spots or streaks
- Symmetry of Form: symmetrical, even, peaked or low centers
- Character of crust: thin & tender, thick or rubbery, blisters, flaky or too moist

Volume meter

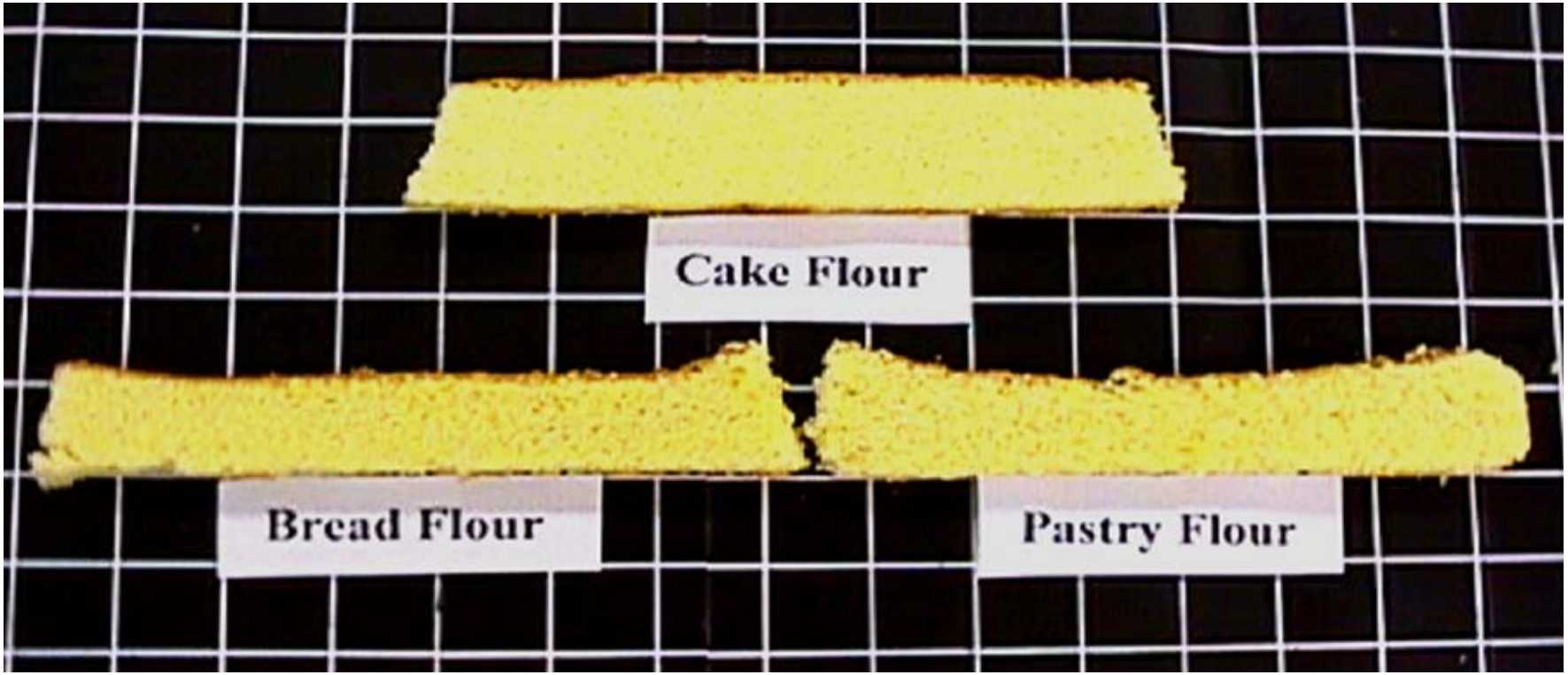
Volume meter

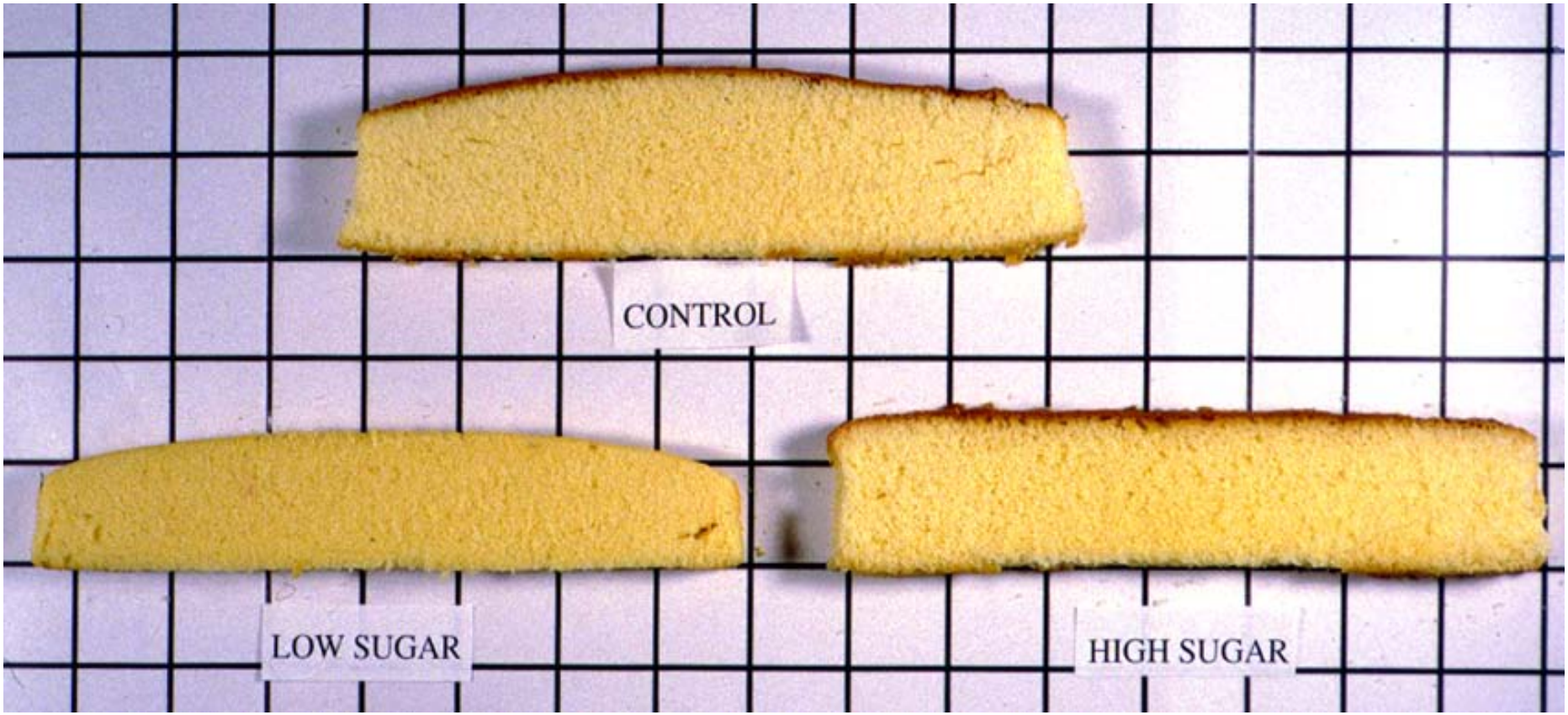


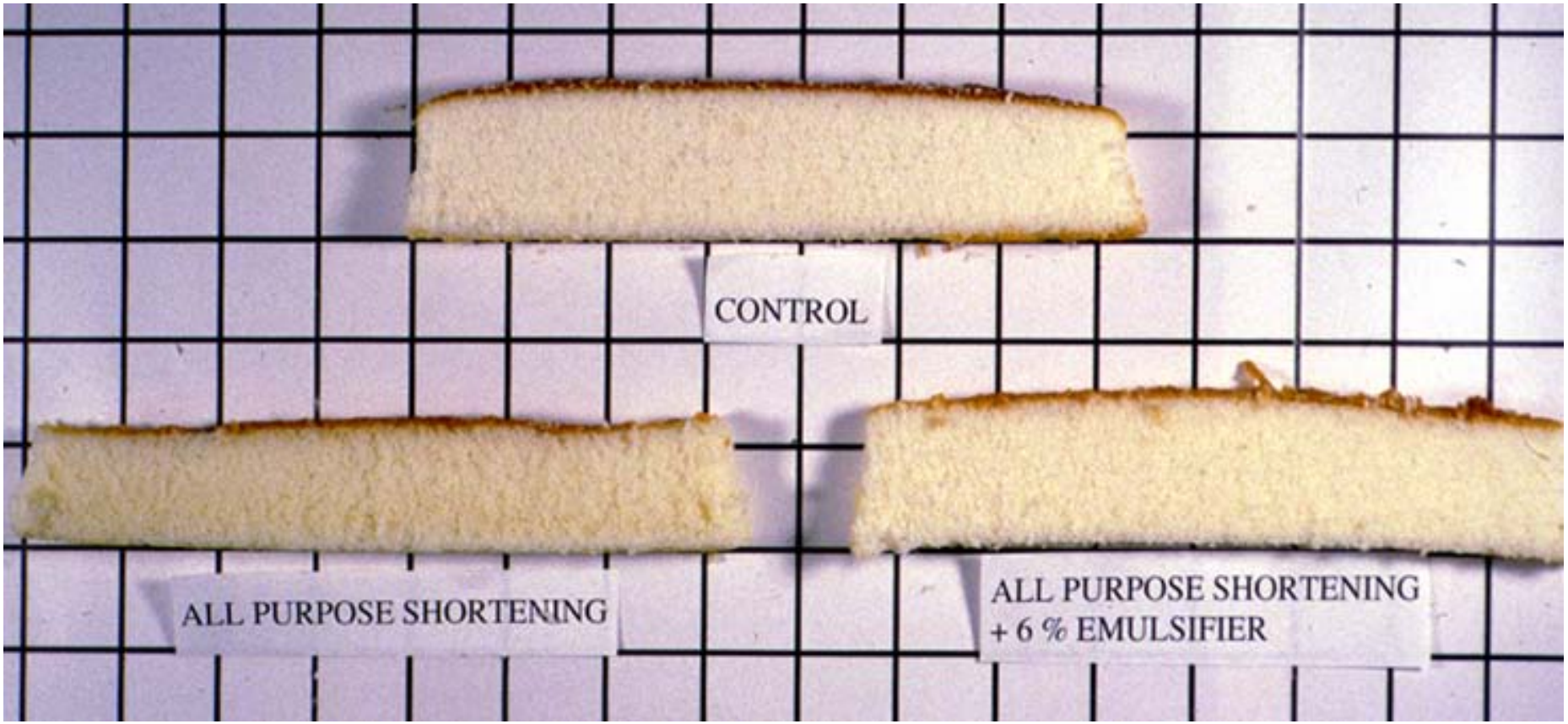
Internal Characteristics

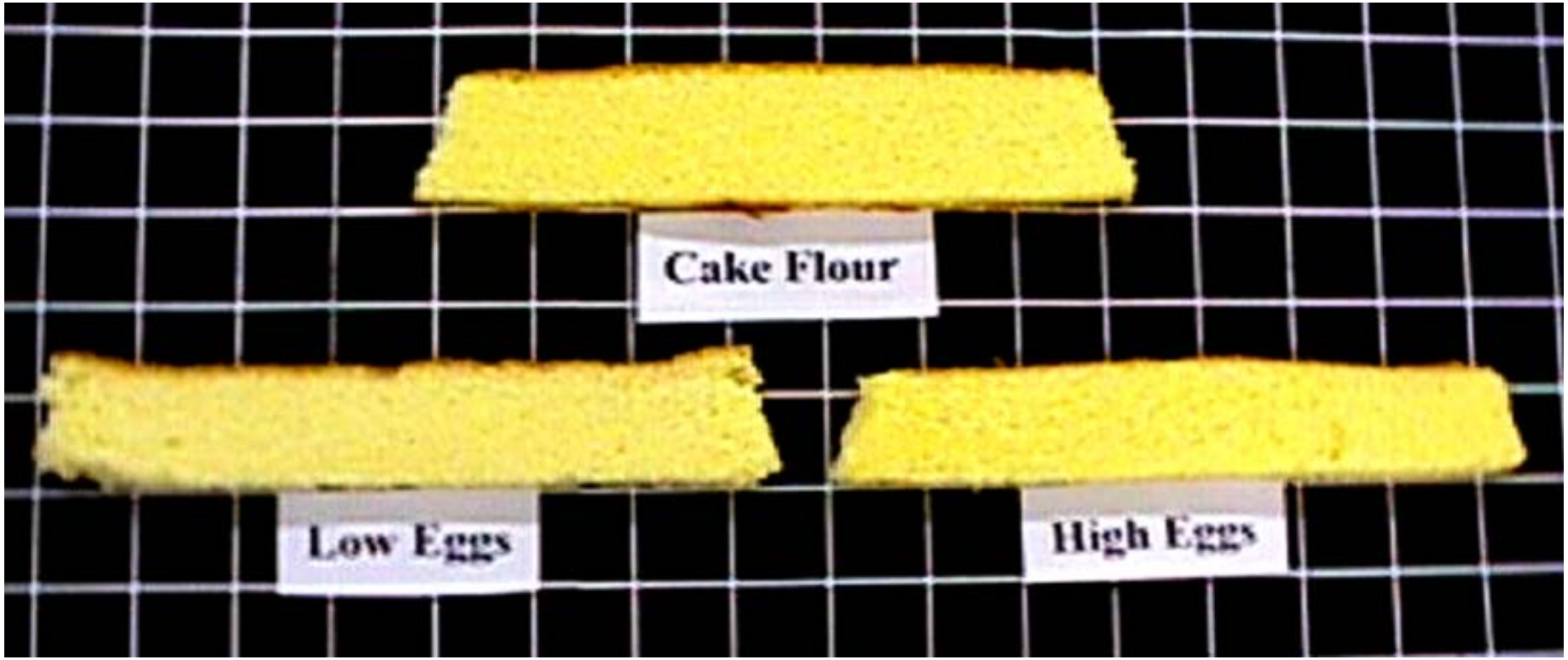
- Grain: uniformity of cell size, thin cell walls, presents of holes
- Color of crumb: color of slice - bright, no streaks or dark patches
- Aroma: sense of smell - sweet, rich, not sharp or foreign
- Taste: pleasant and satisfying sweet flavor, no soda or acid aftertaste
- Texture: sense of feel of crumb surface

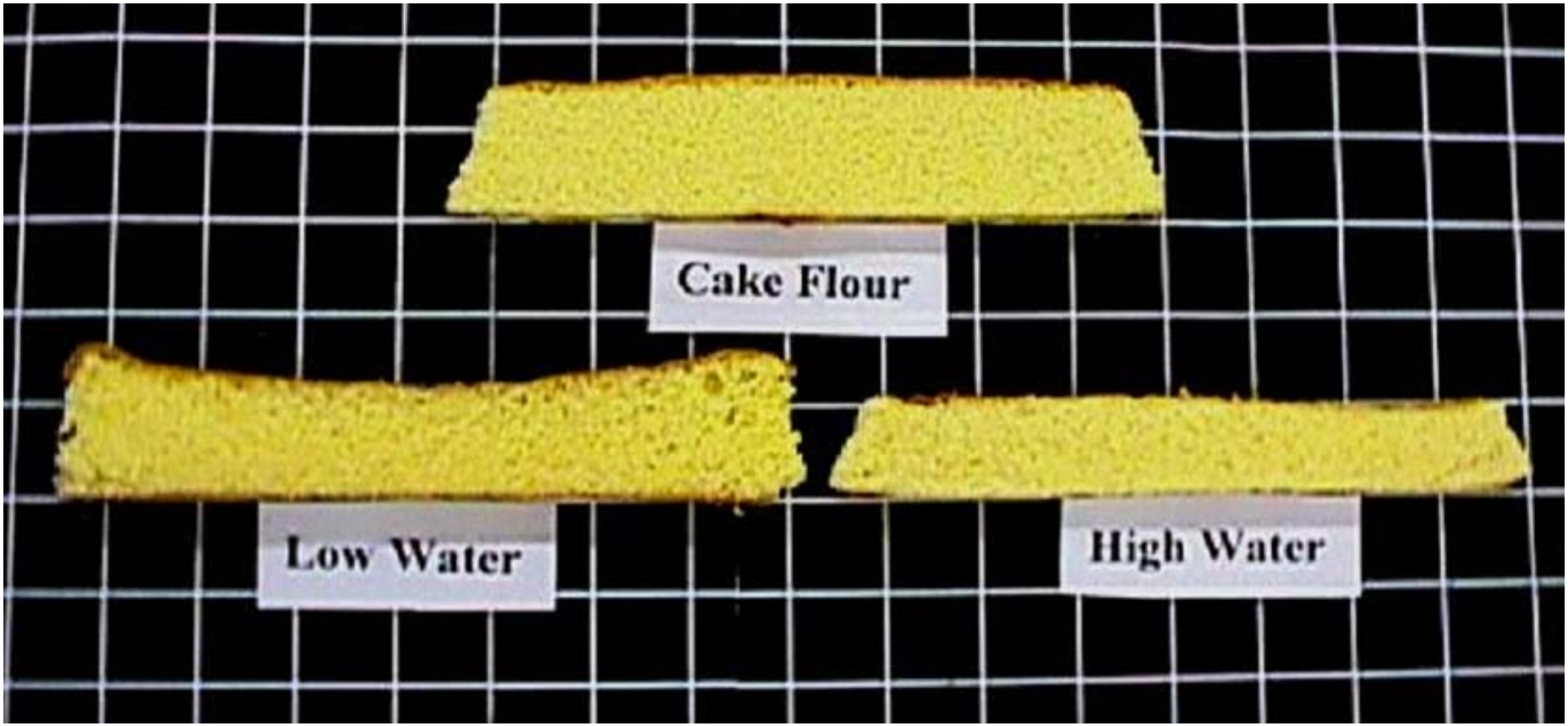
Internal Characteristics

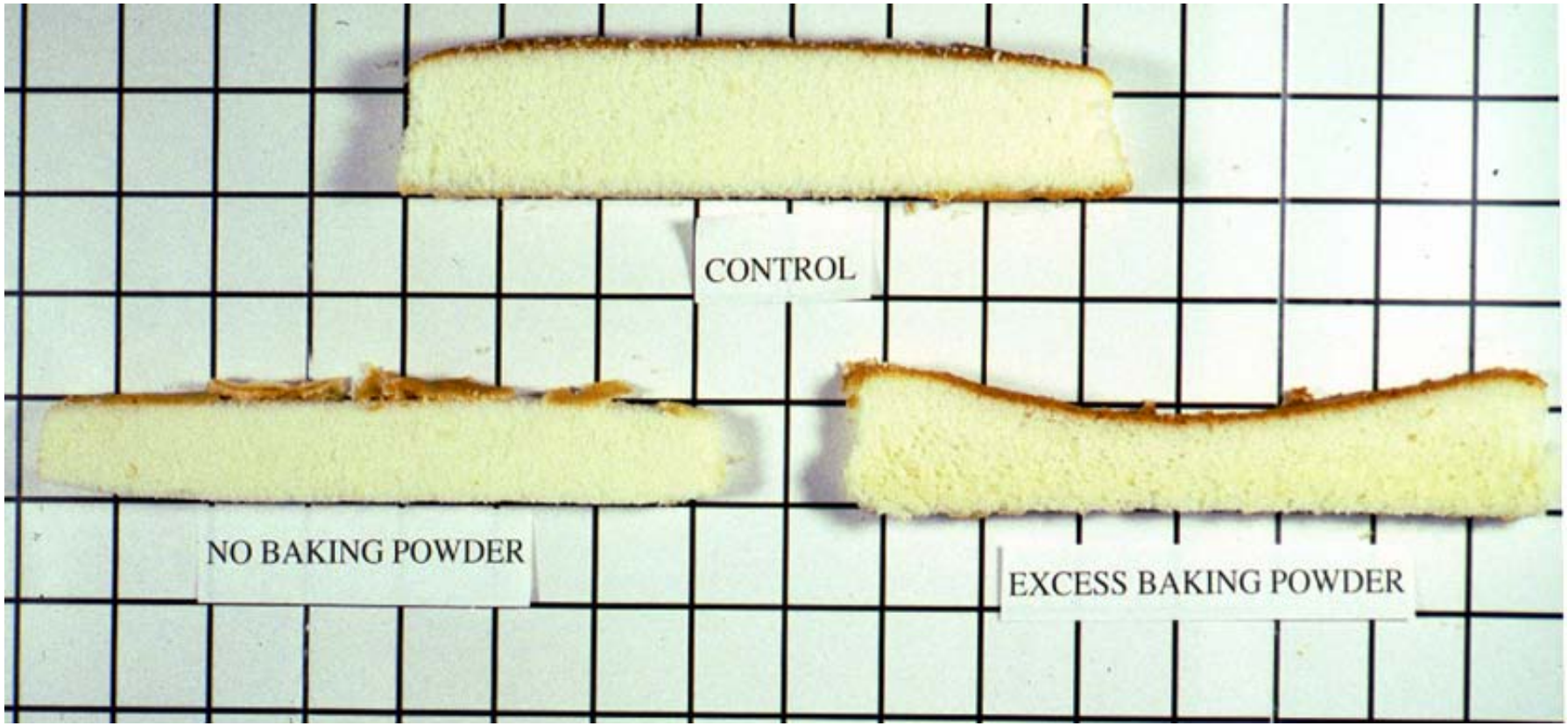


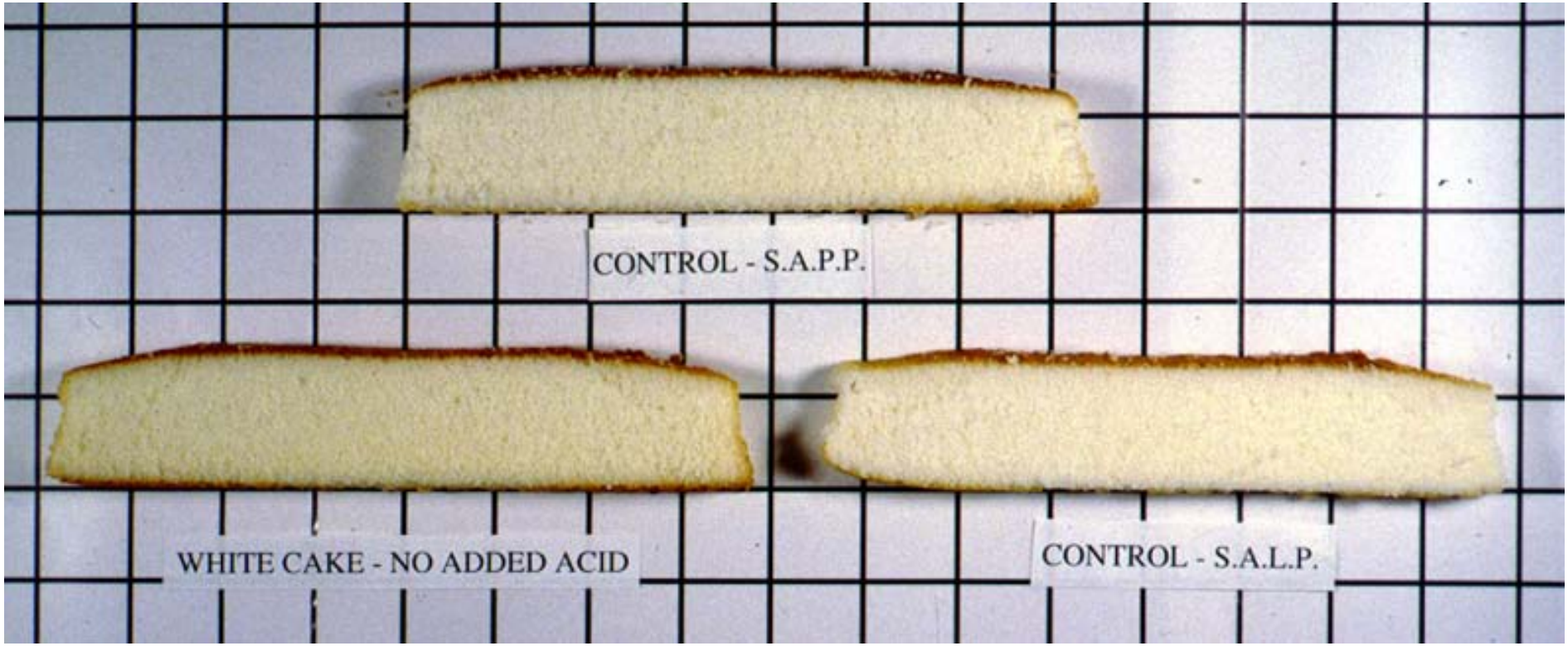


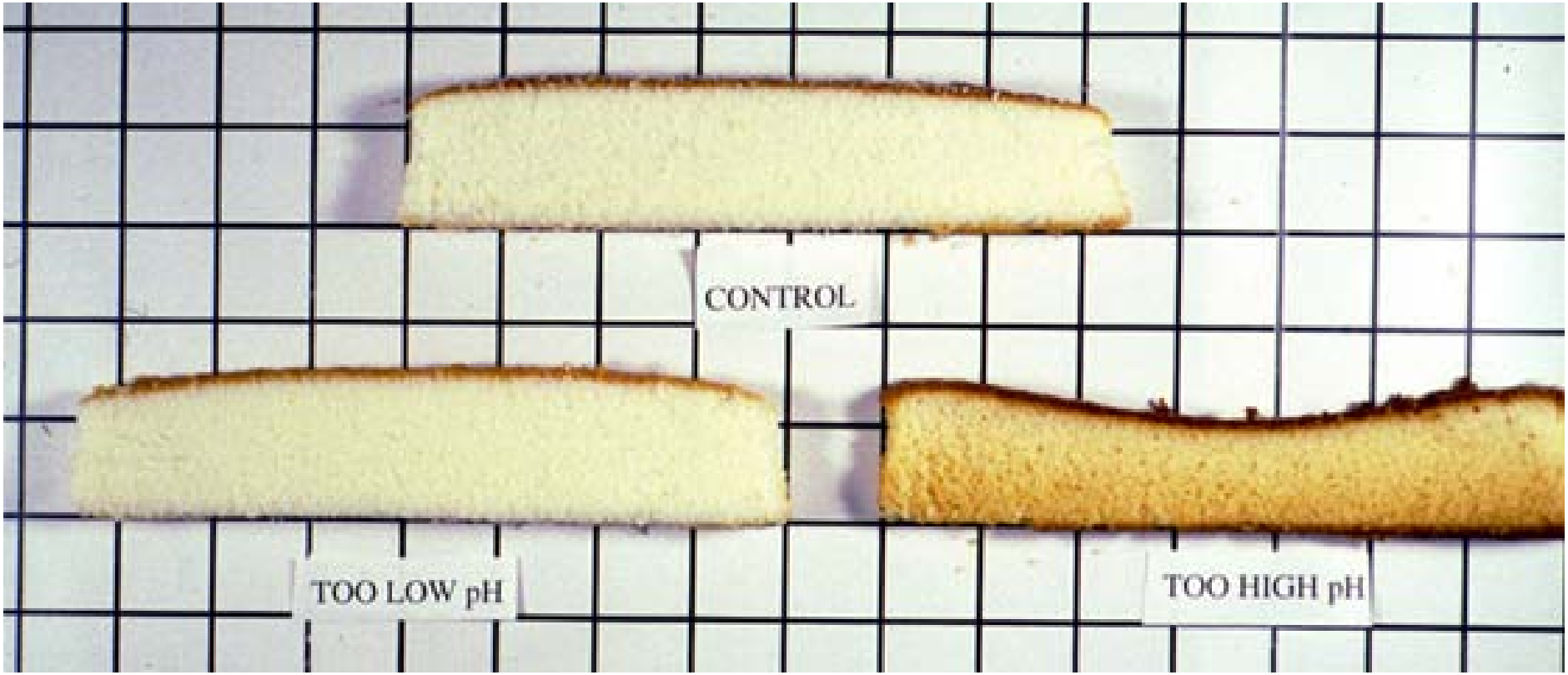












Uneven Layers

1. Batter spread unevenly - placement, spread/fluidity
2. Oven trays not level
3. Cake pans are warped

Cakes Peaked in Center

1. Insufficient shortening
2. Insufficient sugar
3. Insufficient baking powder
4. Batter too stiff
5. Batter over-mixed
6. Too much top heat (excessive air flow)
7. Oven temperature too high

Cakes Sag in Center "M-fault"

1. Excess sugar
2. Insufficient structure builders
   - flour, eggs, water
3. Too much leavening
   - baking powder/air incorporation
4. Too much shortening
5. Oven temperature too low
6. Cakes under-baked
7. Unchlorinated flour - high ratio cakes

Low Volume Cakes

1. Unbalanced formula
   - excess water, too little sugar
2. Insufficient baking powder or air incorporation
3. Batter too warm
4. Not enough batter for pan size
5. Oven too hot
6. Old leavening

Crust Too Dark

1. Excess baking time
2. Oven temperature too high
3. Too high level of a reducing sugar

   ex. milk, corn sugar, honey

Uneven Baking

1. Oven heat not uniform, hot spots
2. Excessive top or bottom heat
3. Variations in baking pans
   - materials, pan weights, depositing weights
4. Warped pans or baking surface
   - poor heat transfer
5. Batter not evenly spread in pans

Tough Cakes

1. Insufficient tenderizing materials
   - sugar, shortening, baking powder
2. Excessive structure builders
   - flour, eggs, water
3. Over-mixing
   - early egg addition

Thick, Hard Crust

1. Oven too hot
2. Cakes baked too long
3. Cakes baked too long at too low of a temperature

Sticky Crust

1. Sugar content too high
2. Excess water
3. Under mixing/uneven mixing

Crust Peels Off

1. Formulation balance
   - excess sugar, shortening, eggs
2. Too much steam in the oven
3. Excess eggs

Poor Taste & Aroma

1. Inferior flavorings
2. Excess flavorings
3. Excess soda or acids - improper pH
4. Rancid shortening or pan grease
5. Lack of or excess salt
6. Bad eggs
7. Absorption of outside odors into ingredients or finished product

    - storage, baking, cooling, packaging

Heavy Cakes

1. Too much sugar
2. Too much shortening
3. Excess liquids
4. Too much or insufficient leavening
5. Cakes under-baked

Cakes Too Tender

1. Too much shortening
2. Too much sugar
3. Too much leavening
4. Too much emulsifier - excess air
4. Batter under-mixed
5. Not enough eggs

Cakes Too Tough

1. Insufficient Sugar
2. Insufficient Shortening
3. Insufficient Leavening
4. Excess eggs
5. Batter mixed - eggs

Coarse Grain

1. Excess baking powder or soda
2. Insufficient liquids
3. Excess sugar
4. Over-aeration at mixing
5. Poor shortening/not enough emulsifier
6. Creaming at high speed
7. Curdled batter
8. Excess floor time before baking
9. Cold oven

Holes or Tunnels

1. Insufficient sugar
2. Insufficient shortening
3. Not enough liquids - batter too stiff
4. Batter mixed improperly
   - mixer speed
   - stages of ingredient addition
   - excess mixing, under-mixing
5. Warm batter temperatures

Tight Grain

1. Insufficient leavening
2. Wrong type of leavening
3. Insufficient sugar
4. Insufficient shortening
5. Excessive liquids
6. Batter too warm after mixing
7. Cake has high pH

Excessive Shrinkage

1. Excess leavening
2. Excess liquids
3. Too lean of a formula
4. Over-mixing
5. Cakes under-scaled
6. Oven too cool
7. Cakes over-baked
8. Cooling cakes too fast

Poor Keeping Quality

1. Insufficient sugar
2. Insufficient shortening
3. Excess leavening
4. Insufficient liquids
5. Over baking
6. Baking temperature too low
7. Dry climatic conditions during cooling

Hollow Spots on Bottom

1. Mix too stiff
2. Mix too fluid
3. Excess eggs
4. Excess bottom heat during baking
5. Moisture in pans

Icings

Icings are coatings of sugar & water blended with various other ingredients such as fat, milk solids, chocolate and other flavors, stabilizers, salt and sometimes coloring substances. A sugar/water system with a delicate balance between dissolved and suspended sugar.

Types of Icings

Non-aerated (flat icings)

- Pouring icings
- Confectionery coatings
- Fudges/fondants

Partially aerated

- Buttercreme icings
- Buttercreme fillings

Aerated (foam type)

- Marshmallow
- Whipped cream
- Whipped toppings

Non-Aerated Icings

Pouring Icings (Water Icings)

		Used for:
Powdered sugar	80 - 85%	Specialty cakes
Water	5 - 20%	Donuts, Danish, Sweet dough

Ingredients:

Sugars, water, stabilizers, fats, salt, calcium carbonate, titanium dioxide, calcium sulfate, sodium hexametaphosphate

Non-Aerated

Pouring Icings Make-up Procedures

Water	25 Lb	Boil 3 minutes.
Stabilizer	10 Lb	
Granulated Sugar	25 Lb	Add and bring back to a boil.
Fat Flakes	3 Lb	
Powdered Sugar	100 Lbs	Add and mix smooth.
Salt	4 oz	
Flavor	Variable	

Non-Aerated

Confectionery Coatings

Pd. Sugar	55-60%
Hard Fats	30-35%

Fast Setting but Expensive

Used for:

Cookies, Snack Cakes, Petit Fours, Specialty Cakes, Donuts

Ingredients:

Powdered sugar, hard fats, milk powder, lecithin, natural cocoa, cocoa butter, salt and vanillin.

Partially Aerated

	Buttercreme	Buttercream
Powdered Sugar	100%	100%
Stabilizer	4	--
Milk Powder	4	3
Cold Water	17	14
Flavor (salt, vanilla)	1.5	1.5
Shortening, Emul.	30-50	--
Butter - unsalted	5 -10	25- 125

Buttercreme Make-up

To improve set:

-- Hard fats
-- Temperature
-- Emulsifiers
-- Gelatin
-- Egg whites
-- Gums
-- Starch
-- Mixing times & speeds

Examine volume, sp. gr. and stability of icing

-- Shortening with improper emulsification
-- Use of too much emulsification
-- Use of wrong type of shortening (SFC, etc.)
-- Look into starches, gums, added emulsifiers

Buttercreme Make-up

Question:

Can I use high fructose corn syrup in my buttercreme icing? If so, how much?

Answer:

HFCS can be used! It does have limitations!

Buttercreme Make-up

What are these limitations?

1. Temperature control is a problem since HFCS is stored warm and the result is an icing with a high inished temperature (takes approximately 140 Lb. to replace 100 Lb. powdered sugar)
2. Appears to have limitations due to its atypical crystallization properties
3. Not acceptable for compound coatings due to HFCS water content

Sugar Bloom

Icing and Glaze Problems

1. Melting--Glaze Breakdown
    a. Increase stabilizer
    b. Increase granulated sugar
    c. Increase fat flakes
    d. Decrease water and apply hotter
    e. Add buffer--calcium carbonate
    f. Breather package
    g. Rigid package--products don't touch
    h. Check boiling conditions for syrup

Icing and Glaze Problems - continued

2. Chipping--Flaking
    a. Decrease granulated sugar
    b. Decrease fat flakes or replace with non-emulsified shortening
    c. Add corn or invert syrup
    d. Decrease stabilizer
    e. Reduce mixing

3. Peeling
    Nonfat dry milk (low level)

Icing and Glaze Problems - continued

4. Waxy Taste
    a. Reduce fat flakes or replace with non-emulsified shortening

5. Slow Drying
    a. Increase granulated sugar
    b. Increase stabilizer
    c. Decrease water
    d. Increase application temperature

Icing and Glaze Problems - continued

6. Lack of shine or gloss
    a. Add small amount of corn or invert syrup
    b. Slightly increase granulated sugar (too much and may become dull)
    c. Decrease mixing or mix low speed

Icing and Glaze Problems - continued

7. "Whitening out" chocolate icing
    a. Add invert syrup or corn syrup
    b. Replace portion of sugar with fondant
    c. Check stabilizer

8. Lack of clarity in glaze
    a. Use stabilizer containing no whitener
    b. Decrease granulated sugar in syrup

Do's and Don'ts of Icing and Glaze

1. Scale ingredients accurately
2. Boil syrup exact time every time
3. Maintain glaze at 115°-125˚F (46°-51°C)
4. Keep glaze covered
5. Make small batches
6. To thin glaze - USE SIMPLE SYRUP
   "NEVER USE WATER"

Do's and Don'ts of Icing and Glaze - continued

7. Reclaim glaze -max. 20 lbs. in each 100 lbs powdered sugar - add reclaim to syrup and bring to a boil
8. Don't circulate icing during shutdowns
9. Don't have "blow off" fan blowing on holding tank
10. Keep constant level in the holding tank
11. Don't mix on high speed
12. Control drying time

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