



# Pozol

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# POZOL

*pozolli* foamy in nahuatl



Acid, refreshing  
beverage

Consumed in  
Southeastern  
México:

Tabasco, Chiapas,  
Campeche,  
Veracruz, Oaxaca

# POZOL

(Cañas *et al.*, Ciencia, 2003)

## INDIAN

Nixtamalización

WASHING

SOAKING

GRINDING

DOUGH  
SHAPING

FERMENTATION

## MESTIZO

Nixtamalización

WASHING

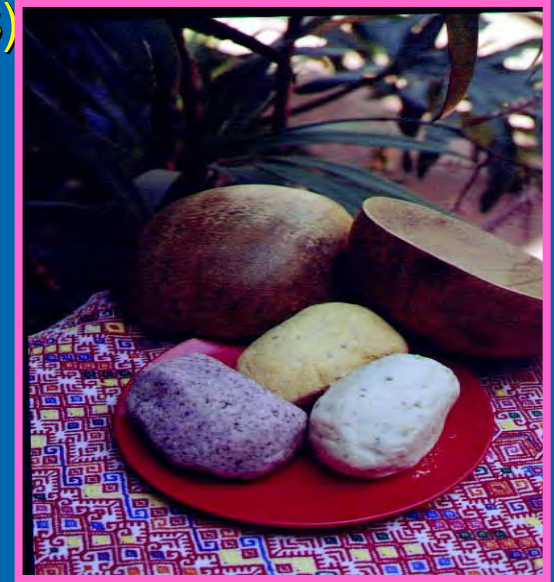
COOKING

SOAKING

GRINDING

DOUGH  
SHAPING

FERMENTATION



# FERMENTED POZOL



# CONSUMPTION



During work,  
as food

Lacandones and  
chamulas:

During long trips

Consumption:

80 to 1000 g pozol  
(dough)/ person/day



# Mestizos



Villahermosa, Tabasco

More than 400

POZOLERÍAS

Cocoa, rice, sweet  
potato

With sweets

# ¿POZOL = MAIZE+ WATER?

Among tsotsiles,

**Pozol** is

*“The strength that runs  
through our veins”*

**CEREMONIAL**

**MEDICINAL**

**To control diarrhea!!**



Natural fermentation  
No inoculum

¿Different microorganisms in doughs from  
different producers?

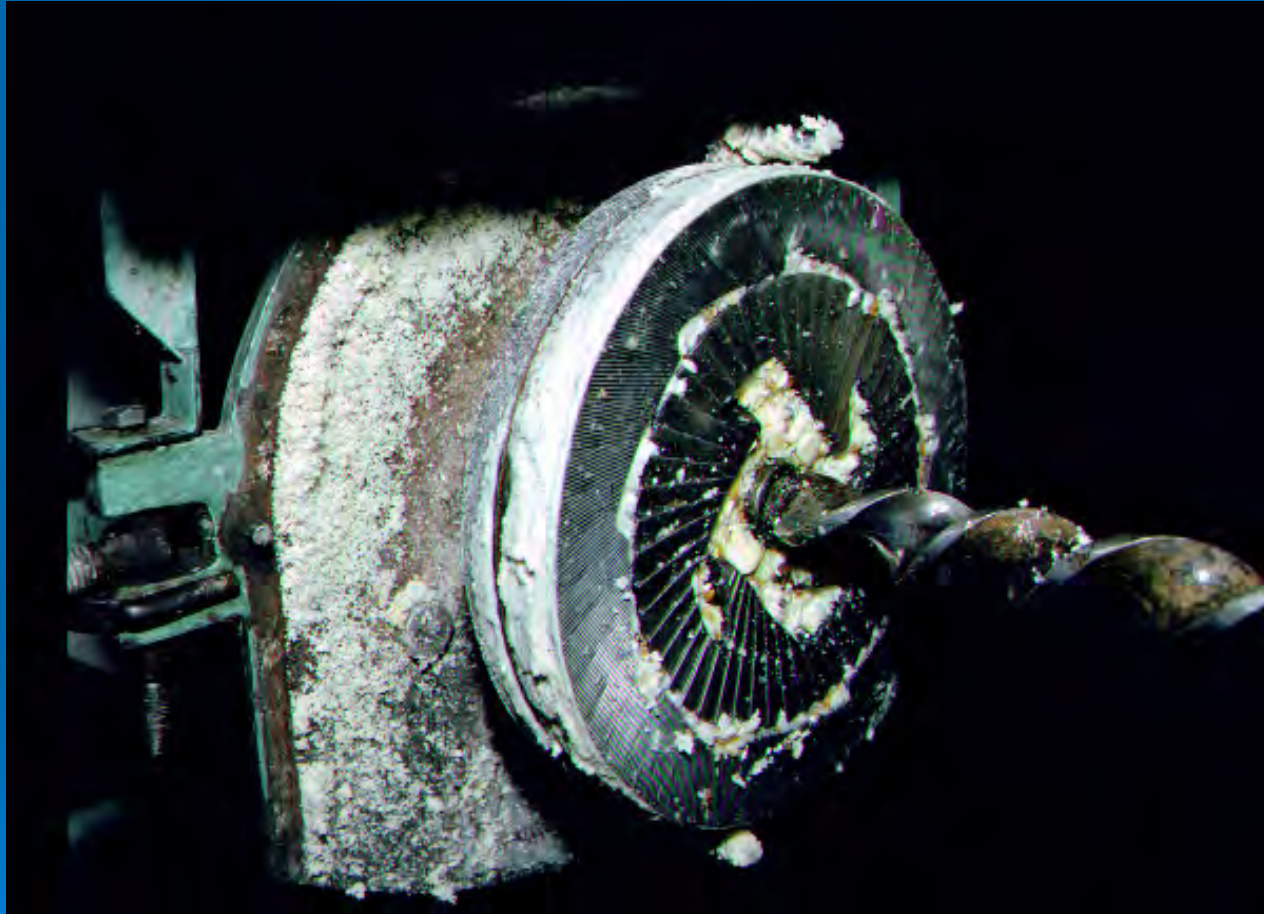




# GRINDING



# Main source of contamination

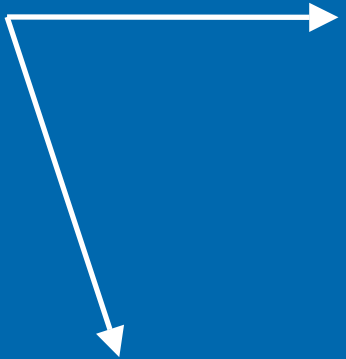




# DOUGH SHAPING



Muestras de pozol  
de 7 productores  
(Villh, Tab.)



Masa Recién Molida



Toma de muestras de pozol



Pozolería de la Fuente

Mercado Pino Suárez



T de fermentación:  
30°C

0

24

48

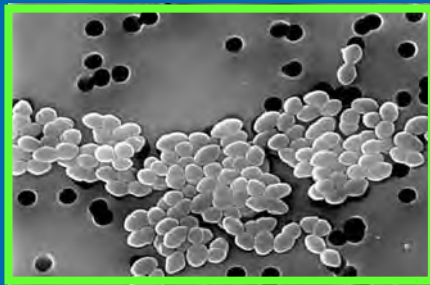
72 h

# Pozol's basic microbiota

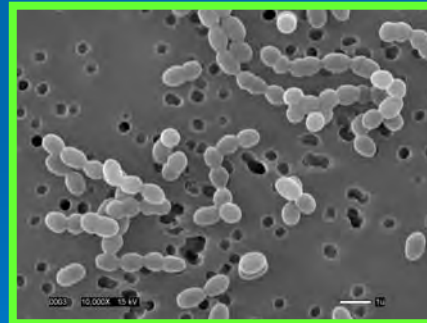
*Streptococcus*



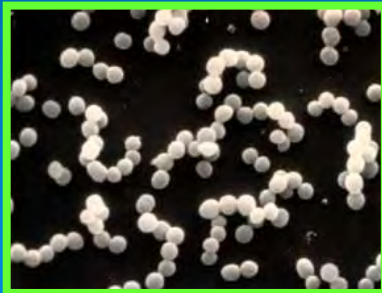
*Enterococcus*



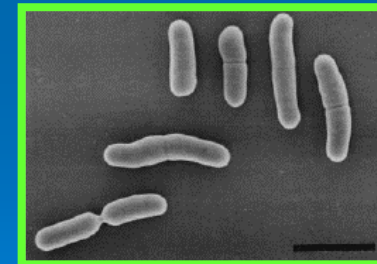
*Leuconostoc*



*Lactococcus*



*Weissella*





# Pathogenic bacteria

*Escherichia coli*

Enteropathogenic  
Enterotoxigenic

**RESISTANT TO LOW pH !!**

# HUMAN INTESTINAL MICROBIOTA

Equilibrated microbiota

Good microorganisms

General healthy condition

Sickness

Non-equilibrated microbiota



# PROBIOTICS AND PREBIOTICS

## PROBIOTICS

The microorganisms

*Streptococcus* spp.

*Weissella confusa*

## PREBIOTICS

*“Food for good microbes”*

Pentose polymers

*Leuconostoc citreum*

## Bacteriocins

*Streptococcus* spp.



# Conclusions

Desirable microorganisms  
Improved nutrition

Potentially probiotic  
Prebiotic production

To keep a balanced gut microbiota  
Healthy

