Art of parboiling & modern innovation in India
The Concept:

- Parboiling – An art
- India – The Mother Land of Paddy Rice Processing
- History of Parboiling in India
- Present Parboiling Practices in India
- New Designs in the Parboiling structure & process Engineering
- Recent papers published on paddy parboiling from CFTRI
- How IT can contribute in Paddy Rice Process Engineering
Parboiling - An Art
Parboiling – An Art

- Parboiling is an art. Processed as per need & as per the demographic knowledge.

- Parboiling process is the native of Asia.

- Popular are
  - East Asian (Thailand, Philippines)
  - South East Asian (India, Bangladesh, Pakistan & Sri Lanka)
Parboiling – East Asian Art

- East Asian – Thailand process is the most popular.
  - Process is of 6hrs cycle.
  - Intakes 2.5TPH, clean & graded paddy.
  - Soaking bins hold 15T paddy each and filled in sequence.
  - Before filling of water (~65°), vacuum is drawn to speedup the water penetration.
  - The tanks will be pressurized to reduce the soaking time to ~5hrs.
  - For final gelatinizing the paddy, autoclave is used. Autoclave can contain 15T of paddy.
  - After filling, the steam is directly injected & the system is pressurized.
Out of 10,000 verities of paddy in the world, 4,000 of them are grown in India...

The parboiling process varies region wise in India.

- Upper Crest India.
- North India
- East India
- Central India
- South India

Parboiling process varies region wise in India based on the type of grain being processed. The Short, Medium & the Long
Present Parboiling System

Labour Centric.............
Present Parboiling System

- A batch of paddy is cleaned and stored in the bins.
- Pre-steamed in smaller tanks in batches.
- Soaked in bigger tanks. Manually, water temperature & soaking time is maintained. Observed regularly.
- Water is drained manually and final cooking is done.
Batch processing, non continuous.


Labour centric & labour dependent.

Quality depends upon the operator & varies batch to batch.

Structure is conventional and lacks innovation.

Operator holds the key on producing the quality of the parboiled rice.

The secret of producing marker style parboiled rice is not with the owner.

Unhygienic
BRIS has:

- A comprehensive database based cloud operating rice intelligence processing system.

- The system that identifies the paddy based upon the physical character, Short, Medium & Long grain.

- The system to process the paddy based on the desired quality. The texture, physical appearance, cooking characteristic, sticky, fluffy & semi-fluffy.
What is BRIS?

- BRIS is “Bhattacharya Rice Intelligence System”
- Dr. Bhattacharya is the father of modern parboiling.
- He has done an extensive research, and has authored many papers on parboiling.
- BRIS is a joint venture, comprising of CFTRI & SKF.
- BRIS offers a perfect package of the innovative infrastructure perfect process engineering for Any kind of grain that grows Globally.
Simplification of PE.

- Globally consumers needs
- CHARACTER quotient.
- GLAMOUR quotient.
CHARACTER –points

Every Consumer Needs .

- Uniform Cooking.
- Natural taste .
- Good shelf life .
- Odor less .
GLAMOUR-Points.

Modern world consumers very fond of Glamour..

Texture according to demography.
Uniform shape and size.
Higher Glaziness index.
Free flowing.
HOW BRIS WORKS

- BRIS is Completely Database Driven Process engineering Operation System.
- More than 5000 Practical Process engineering parameters are compressed and Loaded to Embedded software system.
- User can Input his Desired Texture and Cooking Time (at Consumer Level).
- User must Load Grain Verity details, Like, GV, GT, GM.
HOW BRIS WORKS

Based on Input values .. Processor can Choose

- WHITE
- HALF WHITE
- FAINT YELLOW
- DARK YELLOW
- GOLDEN YELLOW

These are the most common texture accepted Globally.
HOW BRIS WORKS

- Based on The Texture and Other Inputs, Software Picks Suitable PROCESS ENGINEERING parameters and it will transfer to Control panel.
- Entire Operation Will be Completely Automatic.
- Most Efficient and Foolproof STEAM ENGINEERING.
- No Human Interference Required throughout Complete Cycle.
- Advanced Embedded Process Software System.
Developments in the Parboiling Infrastructure & Process Engineering
Developments in the Parboiling Infrastructure & Process Engineering
What BRIS offers?

- BRIS has more than 5,000 proven & practiced parboiling methods across the world in its database.

- Data can be picked-up instantly for processing with the predefined parameters.

- The process integration is done with the user friendly interface with the latest technology software.
Why Pre-Steaming
- To improve the porosity of the paddy rice & to increase the gap between the rice kernel & the husk
- Facilitates & accelerates the soaking process.

Parameters:
- Steam pressure & the temperature,
- Advanced pre-steaming device,
- Pressure/temperature regulating & controlling
- All the process parameters are pre defined.

Result of pre-steaming:
- Porosity is increased.
- Kernel & husk gap is defined
BRIS Process — Soaking

- Why Soaking
  - Process of soaking paddy in hot/cold water
  - Soaking duration varies from 2-5hrs.
  - Water temperature varies from ambient to 74°C

- Parameters:
  - Water temperature
  - Quality of water defined by the BRIS system for the best soaking.

- Result of Soaking:
  - Homogeneous paddy mass
  - Ready for complete gelatinization
Why Final Steaming

- To complete the gelatinization of the grain.
- Attain the desired cooking time expected at the consumer level.

Parameters:
- Steam pressure & the temperature,
- Advanced final-steaming device,
- Pressure/temperature regulating & controlling

Result of final steaming:
- To attain the desired cooking time
- To influence the texture considerably of the grain in milling.
Controlling the constant parameters in drying & in de-bran(Whitening & Polishing) process.

This reduces the stress on the color sorter.

The working load will be nominal on the color sorter as rice will be homogeneous in color.

The result of the parboiled rice data can be saved & the data can be replicated with the same parameters for the next process when desired.
What BRIS Promises

- The performance guarantee of the BRIS with 96% process uniformity Character & Uniform texture.
- Cooking time can be defined by the Processor based on the Limits (AL).
- To implement parameters to achieve best shelf life.
- Desired rice texture code can be applied.
- Most hygienic process & completely human independent.
- Can be operated remotely as well, with an hand held device under a cloud environment.
CONTACT FOR MORE INFORMATION

- SHASHIKUMAR THIMMAIAH
- +91 9686590103
- SKT@SKFGROUPS.COM
- Skype- shashithim.
Q&A Session