

**“SOLAR ENERGY
FOR
QUALITY IMPROVEMENT
IN
FOOD-PROCESSING INDUSTRY.”**

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INDIA

PRINCE

Promoters & Researchers In
Non Conventional Energy.

**MISSION: Energy Independence
through Renewable Sources.**

नूनः जनाः सूर्येण प्रसूताः ।

Means: All that exists was
borne from Sun. *Rigveda*

**WE SALUTE THIS
SUN GOD.**

Background:

**Traditionally open Sun drying is
practiced for preservation of food for
use in lean season.**

Open Sun Drying: Limitations

- Unhealthy condition: Sand particles, dust etc. can get mixed with the food being dried.
- Time duration required is high.
- Loss of color, aroma and taste.
- Inferior quality of product.

Use of Solar Energy for Food Current Status:

- **Match between “Solar Industry” and “Food Processing Industry” is required to tap this immense potential.**
- **New gadgets can be developed to suit need of food processing industry.**

Solar dish concentrators

Capabilities of gadget.

- Boiling.
- Frying.
- Roasting.
- Drying.



Use of Solar Energy for Food Processing: PRINCE Case studies:



2.3 m dia. parabolic dish concentrator.

- Preparation of 'Ayurvedic' medicinal syrups (Kadhas).

(Ayurveda is a Traditional Indian medical science.)

Ashtang Pharmacy Case study:

Ashtang Pharmacy Case study:

- **FINDINGS:**
- **Excellent quality: Syrups prepared were having better potency than those prepared on cooking gas.**
- This process is close to the methods specified in ancient books.
- Lower specific energy consumption.
- Non polluting technology.
- Huge savings in fuel cost. Investment of \$ 275 was paid back in 6 months.

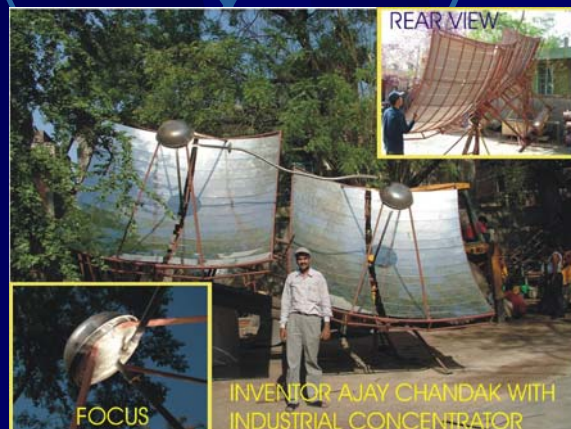
PRINCE EXPERIENCE of Solar dish Concentrators.

- For boiling Amla (Indian Gooseberry) for different applications like Amla candy, Amla pickles etc. **This results in huge fuel savings and better quality produce.**
- For preparing hair oil from Amla and Aloe Vera.
- Roasting of Cashew nut was carried on small scale for viability studies.
- **All applications like boiling, blanching, frying and roasting were successfully tried for different food products.**

Solar Industrial concentrators

Capabilities of gadget.

- Boiling.
- Roasting.
- Drying.



PRINCE EXPERIENCE of Scheffler Solar concentrators



Solar Bakery:



*Wait, Video
Clip will
Operate
Automatically.*

Solar Bakery Case study:

● FINDINGS:

- Scheffler Solar Concentrator of 10 sqm was used.
- Old refrigerator body was converted to oven.
- **Excellent quality: Breads produced were of excellent quality. Very uniform color and puffiness was observed.**
- 180 to 250 loaves of 200 gms were baked in a day.

Scheffler Solar Bakery: Further Development:



Solar box Ovens

Trials on Conventional box type ovens were tried out

Findings: These ovens were found extremely suitable for following applications.

- Roasting of 'Soyabean' for baby food.
- Roasting of 'Cashew Nut'.
- Roasting of ground-nut.
- Baking breads and cakes.

PRINCE EXPERIENCE of Solar Vegetable-fruit dryers

Capabilities of gadget.

- Low temp. Drying.



Solar Dryers Case study:

Findings:

- Amla Candy is dried in these dryers. Commercial production is continued from last two years.
- Trials were successful for green chilly, Moringa leaves, Asparagus, Aloe Vera, Ladies finger, Wheat grass, Gourd etc. for dehydrated products.
- In cashew nut, kernel is covered with testa. These kernels were successfully dried in solar dryers which facilitates easy peeling off of testa.

Solar Dryers Case study:

Findings: Quality of produce through low temperature solar drying is excellent in terms of retention of color, aroma and taste.



Open Sun Dried

Dried in Solar Dryers

Solar Food Processing: Future course of action

- More interaction between solar experts and food processing experts.
- Generating awareness amongst Food processing experts.
- **Experimenting and standardising food processing practices with different solar gadgets.**

Solar Food Processing: Future course of action.....contd.

- **Adopting changes in food processing practices for switching over to solar energy.**
- Innovating processed food products to suit new solar gadgets.
- Inventing/developing new solar gadgets for food processing industry.

Summery

- Experiments reveal that 'Solar food processing' should not be viewed as merely an energy saving method, but it has great value addition because of unmatched food quality it can delivers.

Confirmation from Ancestors



अकालमत्युहरणं, पुष्टितुष्टिप्रदायकं त्रिदोषहरणं, त्रितामकं, सर्वव्याधिविनाशं, ।
सूर्यपक्वान्नमहाऔषध ऋद्धिसिद्धि प्रदायकं ऋणुपूर्व मुनिरार्दुलः सूर्यात्मे अन्नशुभं ॥

Rig Veda'

Sun cooked food improves cellular health and longevity. It strengthens health and mind, removes three major physical disorders associated with digestion, blood and respiratory system & balances inner body temperatures. It glows aura and removes various obstacles. **Sun cooked food is an ultimate medicine.** It enhances intellect, genius. : '

Confirmation from Ancestors.

Ancient Indian References:

रूप रस गंध समायुक्तं पौरुष कान्तिदायक ।
सूर्यपक्कान्महाऔषधि न किञ्चिदपि संशयः ॥

Food cooked by solar heat is lovely in appearance, aroma, flavor, and taste. It is ultimate medicine (Amrita) for manly vigor and glorious skin complexion.:

'Yagyavalk Smriti'

THANK YOU.

**PRINCE MISSION:
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through Renewable Sources.**

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