

Black Soldier Fly technology for fly and odour control in poultry farms

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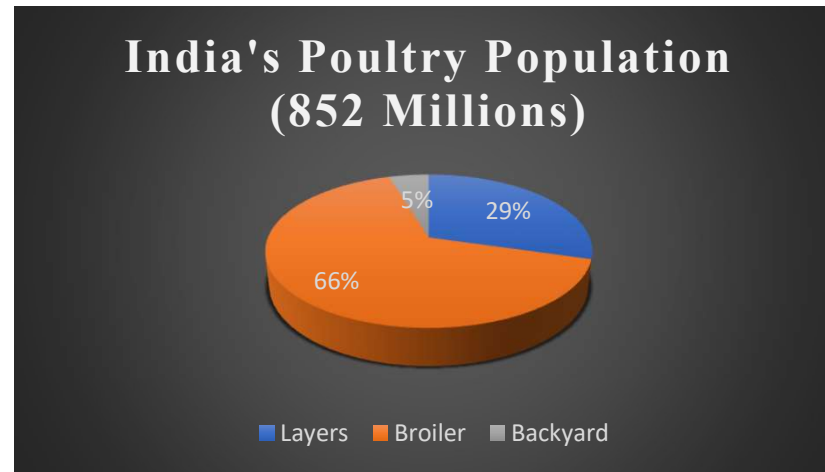
HOLOCENE

Providing Sustainable Solutions for a Better Tomorrow

About **HOLOCENE ECOSOLUTIONS**

- ❖ Established by multi-disciplinary experts - Poultry, Biotechnology, Entomology and Agriculture
- ❖ **Vision** – Develop eco-friendly and carbon-negative technologies for organic waste management
- ❖ Pioneers in India to use insects at industrial scale
- ❖ SPV formed to address poultry manure by  **Sakku group**
- ❖ **Sakku group -**
 - Established in **1979**
 - South Asia's **Biggest Poultry Layer Farms (7.5 million Birds)**
 - Largest egg producer in India – **5 million eggs /day**
 - **Other Establishments:**
 - Sakku Spinning Mills
 - Venkatrama International LLP – Chilli exports

Poultry in India



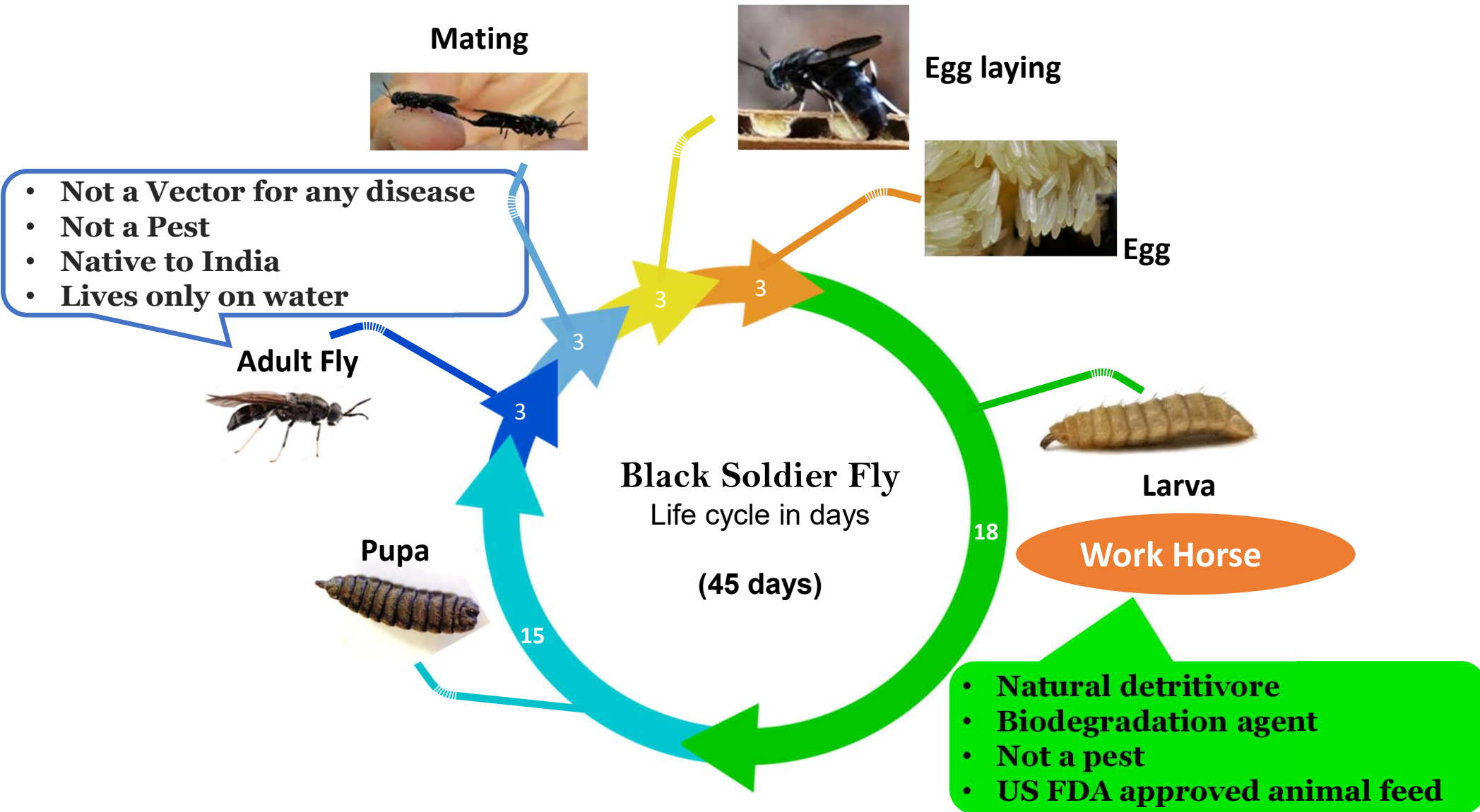
Poultry sector

- ❖ Main source of human nutrition
- ❖ 3rd Largest egg producer
- ❖ 5th Largest Broiler producer
- ❖ Integration of farms
- ❖ Improved marketing
- ❖ Govt supportive programs
- ❖ High density farming

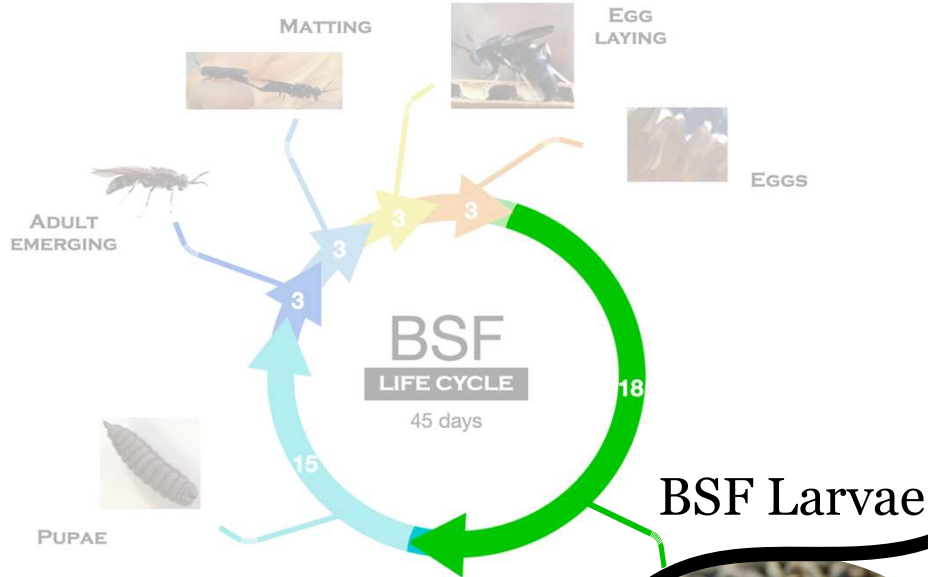
Problems

- ❖ Volatile markets
- ❖ Susceptibility of flocks for diseases
- ❖ Huge volumes of **manure management**
 - ❖ Source of GHG – NH₃, CH₄, N₂O
 - ❖ Unpleasant odours
 - ❖ Air and groundwater contamination
 - ❖ Germs and Flies
 - ❖ Eutrophication of water bodies

Black Soldier Fly technology



BSF larvae as organic waste composter



Protein & fat



Treatment for 10-30 days



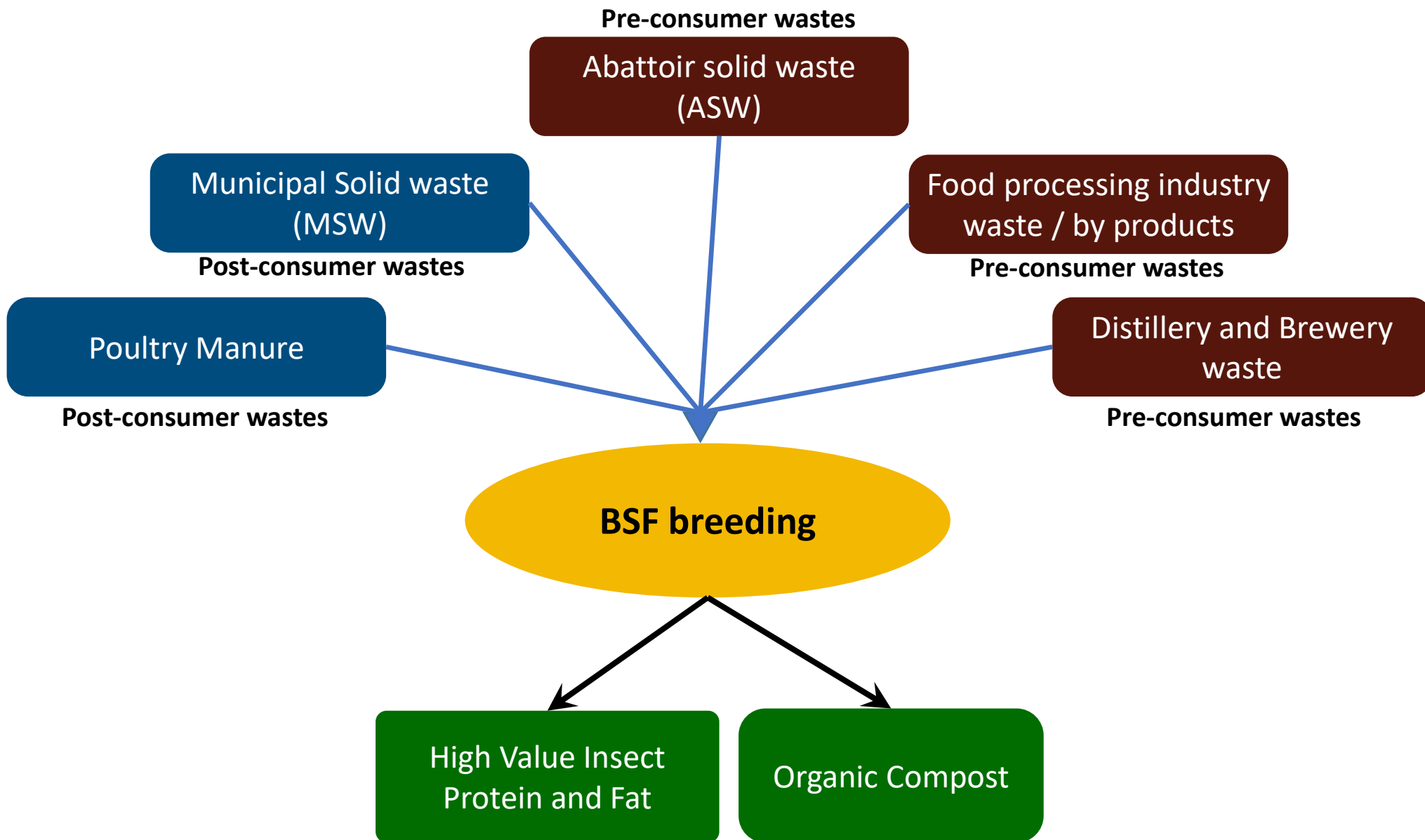
Rich organic compost



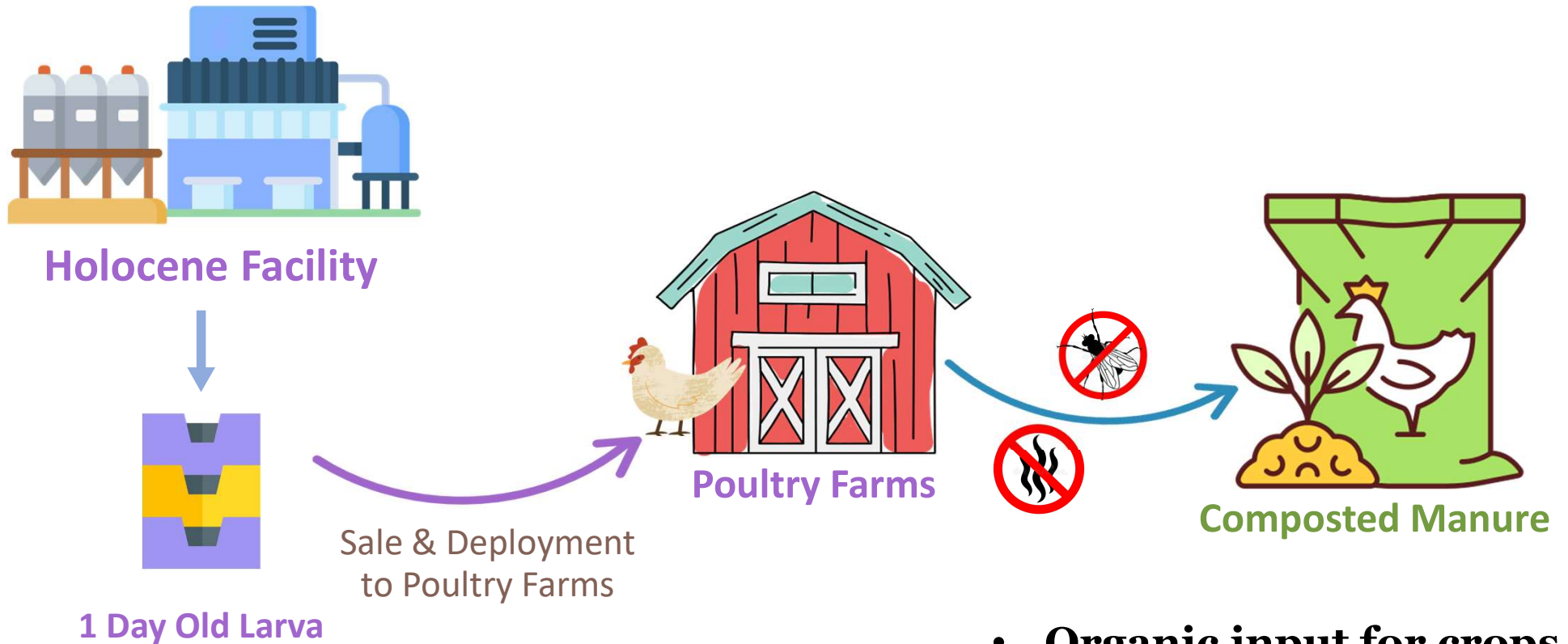
Poultry Manure /
Agri-byproducts /
Organic wastes

- ✓ Part of Circular economy
- ✓ Upcycling of nutrients
- ✓ Zero discharge – Environment friendly
- ✓ Scalable technology
- ✓ Low GHG emissions
- ✓ Reduced unpleasant odours

Scope of the BSF technology



Holocene Business Model for Manure Management



- **Organic input for crops**
- **Soil amendment**
- **Balanced Micro and Macro nutrients**
- **Slow release of nutrients**

Manure Management using BSF larvae

Direct deployment beneath the layer shed



Treating manure collected from High density farms

- 0.6 kg manure (wet) /sq ft /day



Technology benefits

- ❖ Demonstrated and implemented process for **4 years continuously**
- ❖ Environmentally controlled breeding for **round the year egg production**
- ❖ Managing manure of 9 million layers – AP, TS,CG and KA
- ❖ Decreased unpleasant odours in and around farms – Decreased GHG
- ❖ Zero leachate
- ❖ Decreased bacterial born and contagious diseases
- ❖ Rapid composting process
- ❖ No usage of **House fly control** chemicals in and around farms

Microbial Loads in Manure

VRPL - LAB



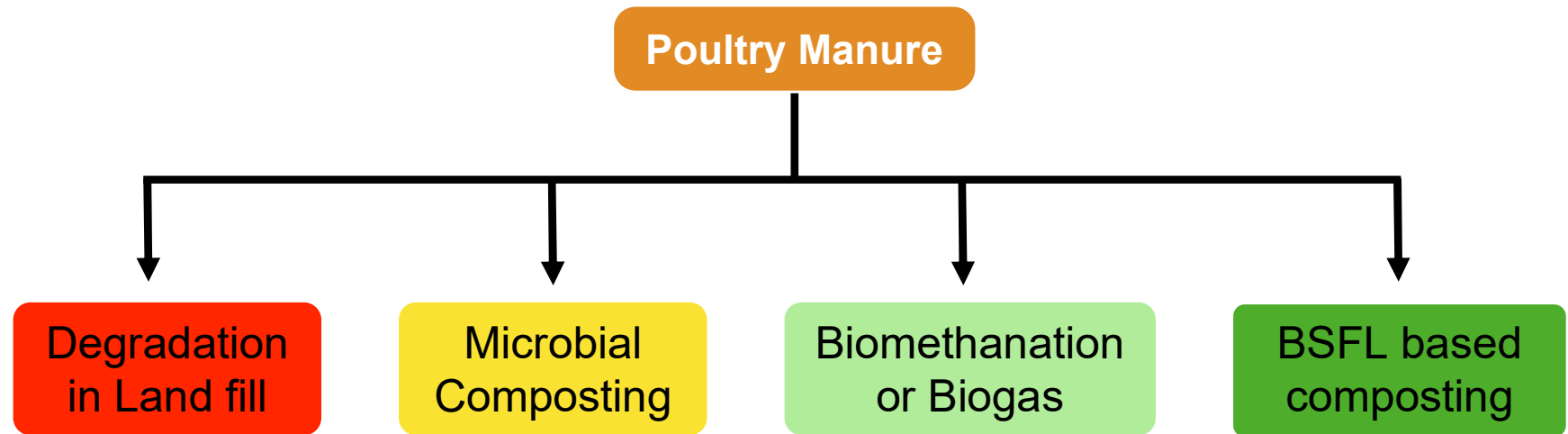
MUNURE MICROBIAL CULTURE REPORTS

| S.NO | SHED.NO | COLLECTING AREA | SAMPLE TYPE | COLIFORM | E.COLI | STAPH | FUNGAL | MOULD | SALMONELLA | CLOSTRIDIA | RANGE |
|---------------|----------|-----------------|------------------|------------------------|--------|-------|--------|-------|------------|-------------|-----------|
| DT:17.03.2021 | | | | SERIAL DILUTION METHOD | | | | | | MILK METHOD | MIN - MAX |
| | SH:1 | AGE:92.4WEEKS | WITH GOLDIES | | | | | | | | |
| 1 | SAMPLE:1 | SHEDS DOWN | MANURE | 0 | 3000 | 0 | 0 | 0 | 0 | 0 | 0-5000 |
| 2 | SAMPLE:2 | SHEDS DOWN | MANURE | 1000 | 0 | 0 | 0 | 2000 | 0 | 0 | 0-5000 |
| 3 | SAMPLE:3 | SHEDS DOWN | MANURE | 0 | 0 | 0 | 0 | 1000 | 0 | 0 | 0-5000 |
| | | | | | | | | | | | |
| | SH:14 | AGE:14.5WEEKS | WITH OUT GOLDIES | | | | | | | | |
| 1 | SAMPLE:1 | SHEDS DOWN | MANURE | 22000 | 34000 | 0 | 0 | 0 | 0 | 0 | 0-5000 |
| 2 | SAMPLE:2 | SHEDS DOWN | MANURE | 18000 | 39000 | 0 | 0 | 0 | 0 | 0 | 0-5000 |
| 3 | SAMPLE:3 | FEEDARS | MANURE | 27000 | 42000 | 0 | 0 | 1000 | 36000 | 0 | 0-5000 |

STANDARD VALUES:

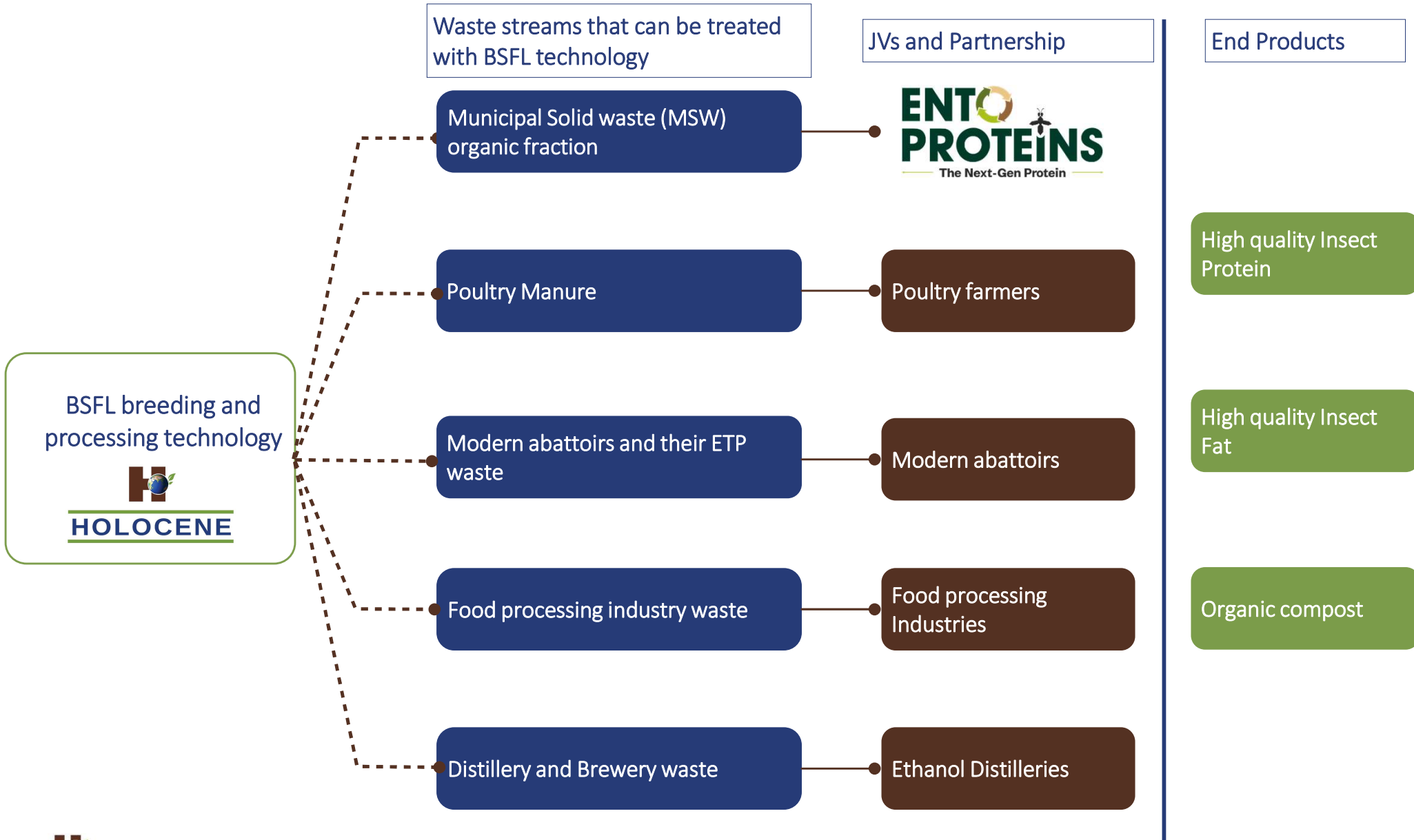
| COLOUR CODE INDICATION | | |
|------------------------|--|-------------|
| | | 0 |
| | | 0-5000 |
| | | 5001-10000 |
| | | 10001-25000 |
| | | >25000 |

Technology benefits



| | | | | |
|---------------------------|-----|---------|--------------------------------|---|
| Investment | LOW | MEDIUM | HIGH | MEDIUM |
| Operating Cost | LOW | MEDIUM | LOW | LOW |
| End Product | - | Compost | Biogas for cooking/electricity | High quality insect protein and fat for animal feed and compost |
| Economic viability | - | - | MEDIUM | HIGH |

Technology Scope



Thank You

Acknowledgements:

- ❑ **Madhu Konarka Paruchuri** - Founder
- ❑ **Dr. Praveen K Sappa, PhD** - CEO & Co Founder
- ❑ **Siddarth Venkatram** - Director
- ❑ **Kiran** - Sales and Marketing Director

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