

Prawn Diagnosis Report

User Responses:

- 1) Is the growth rate good? => Yes
- 2) Is the food intake good? => Yes
- 3) Are the weather conditions good? => Yes
- 4) Is the pond affected by whitegutt previously? => Yes
- 5) Is the plankton growth more or optimal? => Yes
- 6) Are minerals provided 3-4 times every month? => Yes
- 7) Is the estimated count matched with manual count? => Yes
- 8) Are nearby ponds more affected by viruses? => Yes
- 9) Are prawns losing shell at the correct time? => Yes
- 10) Any shell loose cases in pond? => Yes

IoT Sensor Data:

pH: 8.1

TDS: 1200

Temperature: 28.5°C

Image Analysis:

Classification: No issues detected

Confidence: 0.00%

AI Expert Analysis:

1. ANALYSIS OF PRAWN HEALTH:

- Overall health condition: The prawn health appears generally good based on reported growth rate, food intake, and matching estimated and manual counts. However, the presence of "loose shell" cases and a history of white gut disease, combined with nearby viral outbreaks, indicates a state of vulnerability and potential subclinical issues. The 0.0% confidence on the image analysis is concerning and should be disregarded, relying instead on the observable data. We assume the lack of specific image findings is due to limitations in the imaging setup or analysis, not a guarantee of perfect health.

- Potential disease concerns: The primary concern is a recurrence of White Gut Disease (WGD) and a heightened risk of viral infections due to the proximity of affected ponds. Loose shell, while not a disease itself, is a **strong indicator** of stress, potential bacterial infection, mineral deficiency, or early stages of other diseases, including viral ones. WGD is often a secondary infection, flaring up when the prawns are stressed.

- Nutritional status: The prawns are reported to be eating well, and minerals are provided regularly. However, the loose shell cases suggest a possible imbalance or deficiency in mineral absorption, or increased mineral demand due to stress or subclinical infection. It's not enough to simply provide minerals; their uptake and utilization by the prawns are

crucial.

- Growth assessment: Growth is reported as good, which is a positive sign. However, continued monitoring is vital to ensure this trend continues and isn't masking underlying problems that could manifest later.

2. WATER QUALITY ASSESSMENT:

- pH status and implications: pH of 8.1 is within the ideal range. No immediate action is needed on pH.

- TDS evaluation: TDS of 1200 ppm is also within the ideal range. No immediate action is needed on TDS.

- Temperature suitability: Temperature of 28.5°C is within the ideal range. No immediate action is needed on temperature.

- Overall water quality rating: The water quality, based **solely** on the sensor readings, is good. However, the "optimal" plankton growth needs further investigation. Excessive plankton can lead to oxygen depletion at night, and certain types of plankton blooms can be harmful. We need more information about the **type** of plankton present.

3. DIAGNOSES & ISSUES:

1. ****High Risk of Viral Infection (Most Severe):**** Due to proximity to ponds with viral outbreaks. Loose shell can be a symptom of early viral infection, even if not definitively confirmed yet.

2. ****Potential Subclinical White Gut Disease (WGD) Recurrence:**** History of WGD, combined with loose shell, suggests a possible recurrence, even if not yet full-blown.

3. ****Mineral Imbalance/Deficiency (or Increased Demand):**** Loose shell indicates a problem with shell formation, despite regular mineral supplementation. This could be due to poor absorption, increased demand due to stress/infection, or an imbalance of specific minerals.

4. ****Potential Harmful Plankton Bloom (Uncertain Severity):**** "Optimal" plankton growth is too vague. We need to identify the species to rule out harmful algal blooms (HABs).

4. DETAILED RECOMMENDATIONS:

- ****Medication (For WGD, if confirmed, and as a preventative):****

* ****Oxytetracycline (OTC):**** While often used for bacterial infections, its broad-spectrum activity can help manage secondary infections associated with WGD and potential bacterial contributors to loose shell. Administer medicated feed. Dosage: 2-3 grams of **active** oxytetracycline per kilogram of feed, for 7-10 days. **Crucially, check local regulations regarding antibiotic use in aquaculture. Resistance is a major concern, and OTC may not be permitted or effective in all regions.**

* ****Probiotics (Bacillus spp., Lactobacillus spp.):**** Administer through feed and/or directly to the water. These beneficial bacteria can help improve gut health, outcompete pathogens, and enhance immune response. Use a high-quality, aquaculture-specific probiotic product. Dosage: Follow manufacturer's instructions. This is a continuous treatment, not just for a short period.

* ****Consider Herbal Remedies (if OTC is restricted):**** Some herbal extracts (e.g., from **Andrographis paniculata**, **Curcuma longa**) have shown promise in managing WGD and boosting immunity. Dosage and preparation vary greatly; consult with an aquaculture specialist familiar with herbal remedies. **Always prioritize proven, regulated treatments when available.**

- ****Water Quality Adjustments:****

* ****Plankton Monitoring and Control:**** Identify the dominant plankton species. If harmful algae are present, consider using approved algaecides (e.g., copper sulfate **with extreme caution and at very low doses, if permitted**, as it can be toxic to prawns) or bio-augmentation methods (e.g., introducing zooplankton that consume the harmful algae). **Regular partial water exchange (10-20%) with clean, well-aerated water** is crucial to manage plankton levels and remove any potential toxins.

* ****Increased Aeration:**** Even though not directly indicated by sensor readings, increased aeration is a good preventative measure, especially with high plankton levels. Ensure adequate dissolved oxygen levels, particularly during the night.

- ****Feeding Regime Modifications:****

* ****Reduce Feeding Rate Slightly:**** During the treatment period, slightly reduce the feeding rate (by 10-15%) to minimize stress on the prawns and improve feed conversion efficiency.

* **Medicated Feed (if using OTC):** Ensure the prawns consume the medicated feed completely. Monitor feed intake closely.

* **High-Quality Feed:** Ensure the feed is of high quality, easily digestible, and formulated for the specific life stage of the prawns.

- **Mineral/Supplement Recommendations:**

* **Chelated Minerals:** Switch to a chelated mineral supplement. Chelated minerals are bound to organic molecules, which improves their absorption and bioavailability. Focus on calcium, phosphorus, magnesium, and trace minerals. Dosage: Follow the manufacturer's instructions.

* **Vitamin C Supplementation:** Vitamin C is a powerful antioxidant and immunostimulant. Add Vitamin C to the feed at a rate of 500-1000 mg/kg of feed. This is especially important during periods of stress or disease.

* **Immunostimulants:** Consider the usage of an immunostimulant, if legally allowed, to be mixed with the feed.

- **Preventive Measures:**

* **Strict Biosecurity:** Implement strict biosecurity protocols to minimize the risk of introducing pathogens from nearby ponds. This includes controlling access to the pond, disinfecting equipment, and avoiding the transfer of water or animals between ponds.

* **Quarantine (if new prawns are introduced):** Any new prawns should be quarantined and observed for signs of disease before being introduced to the main pond.

* **Regular Health Monitoring:** Increase the frequency of health checks. Look for any unusual behavior, changes in appearance, or mortality.

5. TIMELINE:

- **Expected recovery timeframe:** If the issue is primarily loose shell due to mineral imbalance and stress, improvements should be visible within 2-3 weeks of implementing the recommendations. If WGD is confirmed and treated with OTC, expect a 7-10 day treatment period, followed by a recovery period of 1-2 weeks. If viral infection is suspected, the prognosis is more guarded, and recovery will depend on the severity and the specific virus.

- **Follow-up steps and monitoring recommendations:**

* **Daily:** Monitor feed intake, prawn behavior, and mortality. Check water parameters (pH, TDS, temperature, dissolved oxygen).

* **Weekly:** Perform a visual health check of a representative sample of prawns. Look for signs of loose shell, WGD, or other abnormalities. Repeat the manual count.

* **Every Two Weeks:** Reassess the plankton population and identify the dominant species.

* **Monthly:** Review the overall health and growth performance of the prawns. Adjust the management plan as needed.

* **Post-Treatment:** After any medication course, continue with probiotic supplementation and maintain high biosecurity standards.

Important Note: *This advice is based on the provided information and general aquaculture principles. A definitive diagnosis and treatment plan should ideally involve on-site inspection and laboratory testing (e.g., PCR for viral detection, bacterial culture, and histopathology). Always consult with a local veterinarian or aquaculture specialist familiar with the specific regulations and disease prevalence in your region.*