

Ewe Pregnancy Flow - Detailed Specification (Updated)

Overview

This document describes the ewe pregnancy management flow for the farm management application. It covers sponge and hormone preparation, insemination steps, pregnancy checks, gestation windows, lambing, and per-cycle flexibility (INS2 optional). It also includes reminder logic, a simplified state machine, and UI notes.

1. SPONGE & HORMONE Timeline

- SPONGE (SPG): Inserted to synchronize cycles; typically left for 12–14 days, then removed. - HORMONE (HRM): Often administered at sponge removal (single event). - INS1: Timed ~36–48h after sponge removal. - INS2: Optional, typically ~17 days after INS1. Reminders: - After SPG insert: Remove sponge in 12–14d (overdue alert at +15d). - After SPG remove: Give HRM (optional), plan INS1 in 36–48h.

2. Pregnancy Checks

- Check #1: Earliest 28 days after INS1. - Check #2: Optional at 45–50 days, or farms may choose a single late check ~50d. - App enforces earliest CK1 ≥ INS1+28d; CK2 suggested 45–50d.

3. Gestation & Due Windows

- Gestation ≈ 150 days from conception. - If only INS1: Due = INS1 + 150d. - If INS2 also done: Due window = [INS1+150, INS2+150] (≈17-day span). - Estimated due date = midpoint of window for simple displays. - Lambing window reminders: Start 7 days before due_start, overdue alert 3 days after due_end.

4. Data Model (Entities & Fields)

- EWE: ewe_id, tag_id, dob, status, notes. - BREEDING_CYCLE: cycle_id, ewe_id, status, sponge_insert/remove, hormone_date, ins1_date, ins2_date (opt), check_plan, check1/2_date & results, preg_confirmed_date, gestation_anchor, due_window_start/end, est_due_date, notes. - BREEDING_EVENT: event_id, cycle_id, ewe_id, type (SPG_INSERT, SPG_REMOVE, HRM, INS1, INS2, CK1, CK2, PREG_CONFIRMED, LAMBING, LOSS), event_date, operator, location, ram_or_semen_batch, notes. - LAMBING: occurred_at, litter_size, male/female counts, birth_weights_json, assistance, outcome_notes. - REMINDER: reminder_id, ewe_id, cycle_id, type, scheduled_for, status, channel. - TREATMENT: drug, dose, date, cost, notes.

5. State Machine (Simplified)

NOT_PREGNANT → SPG_INSERT → SPG_REMOVE → HRM → INS1 → [INS2?] → CK1 → [CK2?] → PREGNANT → LAMBING | LOST/FAILED.

6. Reminder Logic

- On INS1: schedule INS2_SUGGEST (+17d, optional), CK1 (+28d), CK2 (+47–50d if two-check plan). - On INS2: recompute due_window_end = INS2 + 150d; optionally re-anchor CK2. - On PREG_CONFIRMED: schedule PREP_LAMBING (start–7d), OVERDUE (end+3d), cancel pending checks. - On CHECK_FAIL: close cycle as FAILED; draft next cycle in 3–7d.

7. UI/UX Highlights

- Timeline chips: SPG Insert → SPG Remove → HRM → INS1 → INS2 → CK1 → CK2 → PRG → LAMBING. - Due window card (start, end, midpoint) with anchor toggle (INS1/INS2/Ultrasound). - Batch actions, color badges, smart date pickers with minimums.

8. Lambing & Conception Resolution (NEW)

Problem: When both INS1 and INS2 are used, exact conception date is uncertain before lambing.

Rule of Thumb: - If lambing occurs ≤ 153 days after INS1 → assume conception = INS1. - If lambing occurs > 153 days after INS1 → assume conception = INS2. Rationale: Gestation ~150 days (± 3). Beyond 153d from INS1 is too late for INS1 but consistent with INS2+150. Model: - BREEDING_CYCLE adds: conception_source (UNKNOWN|INS1|INS2|ULTRASOUND_ESTIMATE|RESOLVED_AT_LAMBING), resolved_conception_date (date). Logic (at LAMBING): - Compute days_from_ins1 = lambing_date – ins1_date. - If has_ins2: - days_from_ins1 ≤ 153 → source=INS1, resolved_conception_date=ins1_date. - else → source=INS2, resolved_conception_date=ins2_date. Else (no INS2): source=INS1. - Update status to LAMBED and persist. UI: - Before lambing: show due window [INS1+150 ... INS2+150]. - After lambing: display “Conception resolved: INS1/INS2” with computed gestation days. Analytics: - Enables success rates for INS1 vs. INS2, tighter herd KPIs.