Cow & Calf Heat Stress Management Checklist

For use in the barn or during veterinary farm visits. Based on peer-reviewed research including Dado-Senn et al. (2020) and Seyed Almoosavi et al. (2021), *Journal of Dairy Science*.

Heat stress affects cows and calves across three critical windows: the dry period, at birth, and through the preweaning period. Use this checklist at the start of each heat event, weekly during high-risk periods, or as part of a routine veterinary farm visit. Work through each section in order — problems identified in the dry cow pen will compound at every step that follows.

FARM / OPERATION	DATE	COMPLETED BY	THI AT ASSESSMENT

1 Dry Cow Pen & Environment

Why it matters — The dry period is when heat stress does the most damage to colostrum quality and fetal development. A heat-stressed dry cow will produce 43% less colostrum with significantly lower IgG — independent of how much she eats.

	ASSESSMENT ITEM	SCCL BENCHMARK	FARM DATA / NOTES
ENVIRONMENTAL MONITORING			
☐	THI recorded at least twice daily (AM + PM peak)	Active cooling warranted at THI ≥ 68	
☐	THI peaks tracked over rolling 7-day period	Sustained THI ≥ 72 = high risk period	
☐	Ambient temperature & relative humidity logged	Record AM low and PM high	
COOLING SYSTEMS — DRY COW PEN			
☐	Shade available at all times (minimum 40 sq ft/cow)	Shade alone is insufficient above THI 72	
☐	Fans operational and providing airflow at cow level	Target ≥ 2 m/s at cow level	
☐	Water soakers/sprinklers functional and cycling correctly	1–1.5 min ON / 5 min OFF when temp > 22°C	
☐	Water access: clean, cool, and sufficient trough space	≥ 3 linear inches of trough space per cow	
COW OBSERVATION & EARLY WARNING SIGNS			
☐	Respiration rate assessed in PM peak heat hours	Normal: < 60 breaths/min. Concern: > 60	
☐	Cows observed bunching, crowding water, or seeking shade	Early behavioural sign of thermal discomfort	
☐	Standing time visibly increased vs. normal	Heat-stressed cows stand longer to expose more surface area	
☐	Feed intake reduction noted and estimated	HS cows reduce DMI ~20%; track weekly average	
GESTATION & CALVING SIGNALS			
☐	Gestation lengths tracked and averaged by month	Heat stress shortens gestation ~6 days; flag < 271 days	
☐	Retained placenta incidence tracked monthly	Benchmark: < 8%; short gestation raises risk 4–5×	
☐	Calving difficulty scores recorded for all calvings	Track CDS ≥ 2 as higher-risk colostrum management cases	

Section 1 Action Items / Follow-Up:

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2 Colostrum Quality & First Feeding

Why it matters — Summer colostrum is not the same as winter colostrum. IgG can drop below 50 g/L in heat-stressed cows. Never assume quality — test every sample. When maternal colostrum is borderline or inadequate, have a colostrum replacer ready to go.

	ASSESSMENT ITEM	SCCL BENCHMARK	FARM DATA / NOTES
COLOSTRUM TESTING			
☐	Every first-milking colostrum tested with Brix refractometer	Pass: ≥ 25% Brix (≈ 50 g IgG/L). Fail: < 25%	
☐	Brix refractometer calibrated with distilled water before use	Should read 0.0% on distilled water	
☐	Colostrum visually assessed for colour, thickness, blood/mastitis	Discard blood-tinged or mastitic colostrum regardless of Brix	
☐	Colostrum IgG mass calculated per feeding (volume × IgG conc.)	Target minimum 150–200 g IgG at first feeding	
COLOSTRUM INVENTORY & STORAGE			
☐	Frozen colostrum inventory maintained year-round	Store at –20°C; label with date, cow ID, Brix reading	
☐	Frozen inventory sufficient for at least 5–7 calvings	Replace inventory if stock is > 8 months old	
☐	Colostrum replacer product on hand as backup	Use a premium whole bovine colostrum product. Use as directed for supplementation, replacement, or enrichment.	
☐	Thawing protocol posted and followed by all staff; feeding temperature verified	Warm water bath 43–49°C (never microwave or boil); feed at 38–42°C; discard if left > 1 hour post-thaw	
FIRST FEEDING EXECUTION			
☐	Colostrum fed within 2 hours of birth	IgG absorption efficiency begins declining immediately	
☐	Volume fed recorded for every calf	8–10% of birth weight at first feeding	
☐	Second colostrum feeding provided within 6–12 hours	Aim for total 150–200+ g IgG delivered in first 12 hours	
☐	Colostrum equipment cleaned and sanitized after every use	Bacterial contamination degrades IgG and causes scours	

Section 2 Action Items / Follow-Up:

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3 Passive Transfer Verification

Why it matters — In utero heat stress compromises the calf's intestinal ability to absorb IgG — even when colostrum management is done correctly. Summer-born calves are at higher biological risk of FPT. Verification is not optional during heat stress periods. You cannot manage what you do not measure.

	ASSESSMENT ITEM	SCCL BENCHMARK	FARM DATA / NOTES
ROUTINE TESTING PROTOCOL			
☐	Serum total protein or serum Brix tested on every calf	Test at 24–48 hours of age; before any illness	
☐	Results recorded individually per calf with dam ID	Link serum TP result to dam cooling status if possible	
INTERPRETING RESULTS			
☐	Serum total protein ≥ 5.5 g/dL = successful passive transfer	Excellent: ≥ 6.2 g/dL; Good: 5.5–6.1; FPT: < 5.5	
☐	Serum Brix ≥ 8.4% = successful passive transfer	Excellent: ≥ 9.4%; Good: 8.4–9.3%; FPT: < 8.4%	
☐	FPT rate calculated monthly and tracked by season	Target FPT rate: < 10% of calves; flag if > 20%	
☐	FPT rate compared between dam-cooled and non-cooled groups	Expect higher FPT rates in calves from heat-stressed dams	
RESPONSE TO FPT			
☐	Calves with FPT (serum TP < 5.5 g/dL) flagged for enhanced monitoring	Daily health scoring recommended for first 21 days	
☐	Transition feed calves that could be high risk or suspected of FPT	calves with unknown colostrum management, received poor quality colostrum, were fed colostrum outside the ideal 2–6 hour window or did not receive 200–300 g of IgG within 12 hours. See the Transition Guide	
☐	FPT root cause assessed: colostrum quality, timing, volume, or absorption	Use Brix testing data + feeding records to diagnose	
☐	Colostrum protocol reviewed if FPT rate exceeds target	Consider colostrum replacer during peak heat stress months	

Passive Transfer Tracking — Summer Season

MONTH	CALVES TESTED	FPT COUNT (<5.5 G/DL)	FPT % (TARGET <10%)	NOTES
			%	
			%	
			%	
			%	

Section 3 Action Items / Follow-Up:

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4 Preweaned Calf Housing & Health

Why it matters — Heat stress doesn't stop at birth. Calves exposed to postnatal heat stress have elevated body temperatures, reduced feed intake, and higher medication rates. Shade alone is not enough — active airflow at calf level is essential during heat events.

	ASSESSMENT ITEM	SCCL BENCHMARK	FARM DATA / NOTES
HOUSING & AIRFLOW			
☐	Active airflow provided at calf level (fans operational)	Target ≥ 2 m/s wind speed at calf level	
☐	Fan placement verified: one at calf level, one above pen	Two fans per group pen significantly reduce body temp	
☐	Hutches or individual pens positioned for cross-ventilation	Orient hutch openings to prevailing wind direction	
☐	Shade available for all calves; direct sun exposure minimised	White or reflective hutch covers reduce internal temp	
☐	Space allowance adequate (no crowding)	Group pens: min 35 sq ft/calf (3.25 m²/calf)	
☐	Bedding dry, clean, and changed frequently	Wet bedding raises pathogen load and skin temp	
NUTRITION & WATER DURING HEAT EVENTS			
☐	Clean, cool water available ad libitum at all times	Water intake doubles in heat stress; prioritise access	
☐	Milk replacer or whole milk feeding times adjusted to cooler hours	Feed in early AM and evening when calves are most alert	
☐	Milk replacer intake monitored daily per calf via autofeeder or records	Flag any calf consuming < 4.5 L/day for intervention	
☐	Starter grain offered fresh daily; stale or hot feed removed	Heat-depressed calves are less tolerant of poor palatability	
☐	Colostrum can be added to milk rations of calves with signs of dehydration or scours	See SCCL Restore Guide	
HEALTH MONITORING			
☐	Respiration rate assessed on calves during PM peak heat (1–3 PM)	Normal: < 40 breaths/min. Concern: > 60 breaths/min	
☐	Rectal temperature checked on any calf with elevated RR or depression	Normal: 38.1–39.2°C. Fever: ≥ 40°C. Heat stress: > 39.5°C PM	
☐	Wisconsin Calf Health Score completed daily during heat events	Score ≥ 2 in any category warrants veterinary attention	
☐	Scours cases identified and treated promptly with oral electrolytes	Dehydration in heat-stressed calves progresses rapidly	
☐	Respiratory cases identified early (cough, nasal discharge, laboured breathing)	Postnatal heat stress tends to increase respiratory morbidity	
☐	Medication events recorded per calf with date, diagnosis, treatment	Track total treatments/calf; target < 1.5 events/calf preweaning	

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HIGH-RISK CALF IDENTIFICATION

☐	Twin calves flagged and managed individually from birth	Each twin must receive own full colostrum feeding; verify FPT
☐	Dystocia calves (CDS ≥ 2) identified and given priority colostrum delivery	Acidosis impairs IgG absorption; tube feed within 30 min if possible
☐	Calves born to non-cooled dams flagged as heat-stress risk	Expect lower birth weight, higher FPT risk, reduced feeding motivation
☐	Calves slow to stand (> 1 hour) tube fed immediately; do not wait	Delay in standing = delay in nursing = lower IgG absorption
☐	Summer-born calves considered for post-Day 1 colostrum supplementation	50–100 g colostrum powder in milk replacer on Days 2–14 supports gut and immunity

Section 4 Action Items / Follow-Up:

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5 Visit Summary & Priority Actions

SECTION	ITEMS FLAGGED	MONITORING FREQUENCY	PRIORITY (H/M/L)	WHO IS RESPONSIBLE	TARGET DATE	PRIORITY ACTION ITEMS
1 — Dry Cow Pen & Environment						
2 — Colostrum Quality & First Feeding						
3 — Passive Transfer Verification						
4 — Preweaned Calf Housing & Health						

Top 3 Priority Actions From This Visit:

Veterinarian / Advisor Signature

Producer / Farm Manager Signature

Next scheduled follow-up

Contact for questions

Key References: Dado-Senn et al. (2020) J. Dairy Sci. 103:4822–4837 | Seyed Almoosavi et al. (2021) J. Dairy Sci. 104, doi:10.3168/jds.2020-19115 | Tao & Dahl (2013) J. Dairy Sci. 96:4079–4093 | Monteiro et al. (2014) J. Dairy Sci. 97:6426–6439

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