

## QLF Beef Applications: Lick-tanks

Lick tanks are designed specifically for self-fed liquid supplements. Typically made of polyethylene, they are covered to maintain product quality. Cattle access the supplement by licking a rotating wheel which is immersed in the liquid. The broad, slightly rough surface of the wheel is coated by the “liquid” (which actually will contain 60-70% dry matter) as it is turned by a cow’s tongue, bringing feed up to the animal.

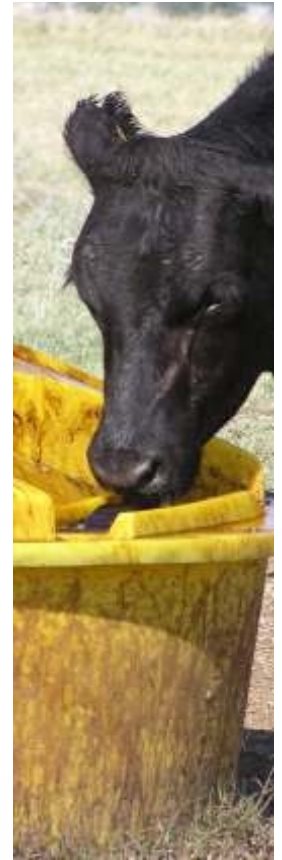
A lick tank will typically have 2 or 4 lick wheels. Producers should allow 1 wheel per 20-25 head of cattle. It is critical that cattle “eat” (lick) rather than drink liquid feeds. Cattle are able to direct most of the fluids they drink directly to their true stomach, by-passing the rumen. To be used effectively, liquid supplements need to flow with the rest of the diet, and be subject to ruminal fermentation.

QLF merchants and representatives can help with tank placement and working with the farmer, can monitor actual intake and take steps to encourage increased or decreased consumption if necessary.

The diagram below shows a QLF lick tank:

### ***The Lick Tank Advantage:***

- 🔥 Several small meals over the course of the day
- 🔥 Less dominant animals can feed un-challenged
- 🔥 Virtually no waste
- 🔥 Intake can change as required
- 🔥 Animals can match intake to individual needs



# Focus on Lick Tanks

Lick tanks are the most common method of delivering liquid supplements to beef cows. They are effective, convenient, and economical. Records show that cows adjust their intake to compensate for changing forage quality and availability.

Average Lick Tank Consumption												
Actual Multi-Year Records (Grams / Head / Day)												
Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Tennessee	741	718	668	518	186	182	186	227	395	504	632	713
Wisc./Minn	877	700	641	923	100	164	223	282	350	1027	1059	686

## Nutrition:

QLF beef supplements are formulated to complement available forages. When managed properly, offering these feeds in free-choice lick tanks optimises forage use and helps cattle maintain condition and performance.

Unlike some dry feeds, QLF liquid products don't contain any "fillers" or low-value carriers. Every ingredient is a significant contributor to the supplement's nutrient profile. QLF's liquid feeds are molasses-based; QLF is the largest user of domestic beet molasses in the UK, ensuring quality, consistency and a high level of natural protein and sugar. Other liquid ingredients such as cane molasses and lactose are used to fine tune physical characteristics, specific nutrient levels, and/or handling properties of the final product.

These high-inclusion ingredients provide readily-available energy (sugar) to stimulate ruminal fermentation, ensure a base level of natural protein and contain significant levels of some essential minerals.



# Focus on Lick Tanks

## Safety:

When QLF liquid supplements fed on an ad lib basis are properly managed, safety is not a concern. However, urea is a feed ingredient that has, under certain conditions, led to ammonia toxicity in cattle. Users of NPN feed supplements simply need to understand the whole picture.

“Urea poisoning” is actually ammonia toxicity. High ruminal ammonia concentrations can result in movement of ammonia to the bloodstream, and then to the liver for conversion to “non-toxic” urea. The problem occurs if blood ammonia levels exceed the liver’s ability to detoxify it.

### Urea by Numbers:

Crude protein is, by definition, 16% N (nitrogen).

Crude protein is then calculated as  $\% N \div 0.16$

Urea, which is 45% N, is  $45 \div 0.16 = 281\%$  Crude Protein

So the amount of urea in a feed is calculated:  $\text{NPN equivalents} \div 281\%$  (or 2.8)

How much urea does a cow get at the lick tank?

Example: Liquid supplement with 28% CP equivalent from NPN

$28 \div 2.81 = 10\%$  urea

Assume 1 kg consumption

$1 \times 0.10 = 100$  grams of Urea

What does it take to cause a problem?

In research that rehearsed a worst-case scenario (fasted animals receiving a pulse dose of urea straight to the rumen) toxicity symptoms were triggered by 27.5 g urea / 45kg BW.

**When urea was given as urea phosphate (the form used in QLF), it took 40g / 45kg BW before signs of toxicity. Using QLF ‘Timed Release’ Protein urea toxicity fell by 45%**

On that basis the toxic level for an 500 kg cow =  $11 \times 40 = 440$ g

Example: Liquid Supplement with 30% NPN equivalents

1 kg = 107 grams of Urea

$440 \div 107 = \text{OVER } 4.12$  kg OF LIQUID FOR TOXICITY  
(which would have to be consumed in a short time period)



# Focus on Lick Tanks

## Consumption:

Voluntary consumption of liquid supplement is expected to vary as supplemental needs change. The gap between nutritional requirements and forage nutrient supply fluctuates significantly as cows move through the stages of production, environmental conditions change, and as forage quantity and quality changes.

When introduced to lick tanks, cattle go through an initial “adjustment” and may consume relatively large amounts of liquid for a limited time (usually 2-3 weeks). If a lick tank is empty for as little as 2 days, cattle may repeat this adjustment (temporary high intake) behaviour when re-supplied with supplement. Depending on animal needs, “normal” consumption may range from less than 0.11 kg per day to 2-3 kgs. Calves will also use lick tanks.

When “over-consumption” or “under-consumption” are experienced it must be determined as whether this judgement is made from the cow’s perspective (nutritional) or the producer’s (economic).

- 🔥 The diet should be evaluated, based on actual forage analysis.
- 🔥 Calculated requirements need to account for cow size, age and breed type, stage and level of production, and environmental factors.
- 🔥 Be sure the animals aren’t being forced to meet their mineral or water needs from the lick tank.
- 🔥 Re-check the actual consumption figures. Could there have been any miscalculations, physical spills, or significant wildlife consumption?
- 🔥 Go back to the basics of lick tank management. Evaluate tank placement, the physical condition of the tank, and check for product contamination.
- 🔥 Now, if necessary, adjust forage or water supply, mineral program, tank placement or maintenance, or QLF product.



# Lick Feeders: Points to Note

Free-choice feeding of liquid supplement is a convenient and economical method of supplying nutrients to livestock. It is not a cure-all for all programs. The management practices outlined below should be followed for safe, efficient utilisation of the QLF liquid supplement.

## Feeding Program:

Cattle need a healthy rumen fueled with adequate forage to benefit from liquid protein supplements. QLF beef supplements are designed to complement a roughage diet and enhance forage utilisation – not substitute it. Therefore ensure that:

- 🔥 Cattle are in good healthy condition
- 🔥 Cattle have, and have had, access to adequate forage and are not fasted or underfed
- 🔥 Proper minerals and salt have been fed free-choice for a sufficient period prior to lick tank availability (intake levelled out at expected intake rate)
- 🔥 Adequate fresh water is available
- 🔥 Other NPN sources will be accounted for to avoid exceeding recommended levels of total dietary intake

## Lick Tank Placement:

QLF protein supplements are designed for delivery via lick-wheel feeders, or by incorporating QLF into the ration – not open tanks or troughs. Feeding at the lick tank should require a specific decision on the cow's part; over consumption will occur if the tank is available for casual feeding in an area adjacent to where cows will spend time for other purposes. Therefore ensure that:

- 🔥 Lick tank is clean and lick wheels are secure and rotate freely and tank is set level
- 🔥 Lick tank is placed where cattle do not congregate; minimum of 15 metres from water
- 🔥 Lick tank is not placed on path to water, or under shade trees or behind windbreaks where cattle congregate
- 🔥 Lick tank is located away from possible sources of contamination, e.g. roof run-off
- 🔥 Lick tank is placed to avoid excessive heating and restricted air circulation

## Management:

Your feeding program should be based on defined goals and expected intake. Management should include monitoring performance and consumption, and taking basic precautions to ensure maintenance of product quality. Therefore ensure that:

- 🔥 Any new cattle being given lick tank access will be well-fed before moving
- 🔥 Lick tank consumption will be checked on a regular basis and ration adjustments made if needed
- 🔥 If cattle cannot access product for 2 or more days (tank completely empty or physically inaccessible, cattle moved before tank, etc.), the animals will need to re-adjust to the liquid; handle the refill as a new placement (be sure cattle are well-fed, recognise potential for temporarily increased intakes, etc.)
- 🔥 Lick tanks will be cleaned as needed, at a minimum of once a year



# Focus on Lick Tanks

## Effectiveness:

Considerable re-search has taken place over the effectiveness of lick tanks.



### UNIVERSITY OF KENTUCKY (Ely et al.1996)

- 🔥 Beef cows and heifers
- 🔥 Pasture May - October
- 🔥 With or without 32% lick tank supplement

Supplemented cows had higher BCS throughout  
Calves from the supplemented treatment weighed 6.8 kg more



### UNIVERSITY OF FLORIDA (Arthington et al.2004)

- 🔥 Yearling heifers
- 🔥 Winter Pasture
- 🔥 Supplement treatments

A. Wheatfeed cubes, 3 / week  
B. Molasses / Protein supplement

No difference in growth  
Pregnancy rates improved by 50% with molasses



### MONTANA STATE UNIVERSITY (Earley et al. 1999)

- 🔥 Angus cow / calf pairs
- 🔥 Improved Pasture, late July - October
- 🔥 With or without 41 % CP, 3% fat lick tank supplement

Calf ADG was doubled in supplemented pastures  
Cow daily gains increased 32% in supplemented pastures

