



Unit : Fluid therapy in cattle
Lesson : 2

Fluid therapy in cattle

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Calculation of fluid requirement

- Fluid deficit in litres = % dehydration x body weight

Example

Calculate the fluid deficit for a cow with 360 Kg body weight and 10% dehydrated

- Body weight = 360 kg

Fluid deficit in liters

$$= \% \text{ dehydration} \times \text{body weight}$$

$$= 10\% \quad \times \quad 360$$

$$= 10/100 \quad \times \quad 360$$

$$= \mathbf{36 \text{ liters}}$$

Substituting in the water distribution

Total deficit = 36 litres

ECF = $TD \times \frac{1}{3}$

= $36 \times \frac{1}{3}$

= **12 litres**

Substituting in the water distribution

$$\begin{aligned}\text{Plasma} &= \text{ECF} \times \frac{1}{4} \\ &= 12 \times \frac{1}{4} \\ &= \mathbf{3 \text{ litres}}\end{aligned}$$

Or

$$\begin{aligned}\text{Plasma} &= \text{TD} \times \frac{1}{12} \\ &= 36 \times \frac{1}{12} \\ &= \mathbf{3 \text{ litres}}\end{aligned}$$

Plasma:

Immediate requirement to be given within ½ to 1 hour

With 50% given in first 6 hours : 9 litres

Remaining within 12-24 hours : 24 litres

- **Acute**

More quickly

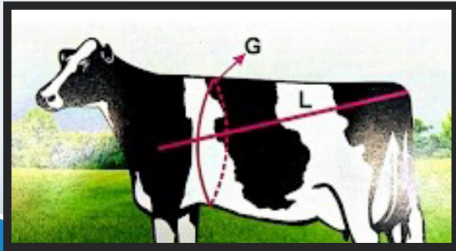
Calculation of body weight

- ➔ Formula
- ➔ Android app
- ➔ Weight measuring tape
- ➔ Weighing machine

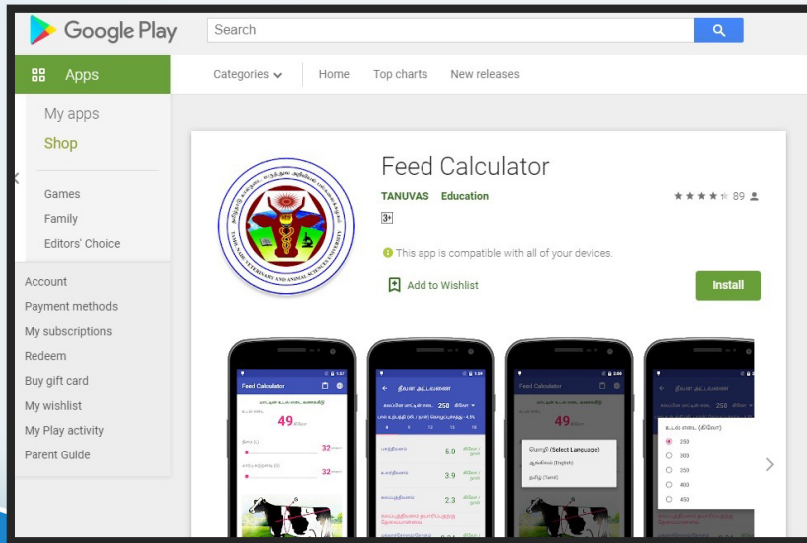
Shaffer's formula

$$W = LG^2 / 300$$

- L - Length of the animal from point of shoulder to point of buttocks in inches.
- G is the chest girth of the animal in inches.



Feed calculator



The screenshot shows the Google Play Store interface for the 'Feed Calculator' app. The app is developed by TANUVAS and is categorized under Education. It has a 4.5-star rating from 89 reviews. The app is compatible with all devices. Below the app title, there are four preview images showing the app's interface on a smartphone. The interface includes a header with the TANUVAS logo, a main display area showing feed calculation results (e.g., 49, 32, 3.9, 2.3), and a bottom navigation bar. A language selection dialog is also visible in one of the preview images.

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Feed Calculator
TANUVAS Education 4.5 ★ (89)

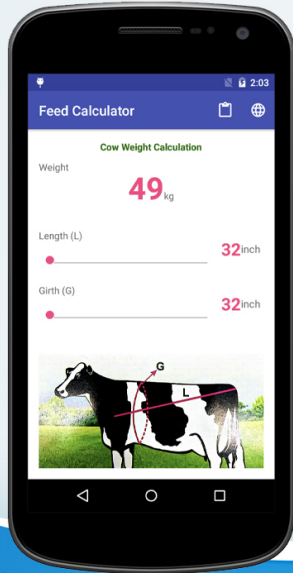
This app is compatible with all of your devices.

Add to Wishlist Install

Feed Calculator interface preview images:

- Image 1: Main screen showing feed calculation results: 49, 32, 3.9, 2.3.
- Image 2: Main screen showing feed calculation results: 258, 3.9, 2.3.
- Image 3: Language selection dialog: "Change! (Select Language)" with options for English (English) and Malayalam (Malayalam).
- Image 4: Settings screen showing "Build units (kg/ton)" with radio button options: 250, 300, 350, 400, 450.

Calculation of body weight



TANUVAS FEED CALCULATOR app
- Google play stores

Calculation of Total Fluid requirements

- **Volume of Replacement**
- **Volume of Maintenance**
- **Volume of Production requirement**

Lisboa, 2004

Montana, 2017

Take home points

- Each 1 litre of milk produced require 1 litre of water
- Body temp normal range: 101.5 to 102.5 F
- Each 1* increase in temperature raises above the normal range
- An additional **4.5- 5.0 litres** of water above 24 hour baseline requirement

Example

Calculate fluid requirement of a cow with temperature of 103.5°F and milk yield of 5 litres

- Elevated Temp =
5 litres of water x 1°F = 5.0 L
- Milk production =
1 litre of water / litre of milk x 5 litres = 5.0 L

Over and above the maintenance requirement

Fluid Therapy in Adults

1. Most likely dehydration not overt shock.
2. Negative base excess.
 - Mature cattle twice as likely to be alkalotic.
 - Exceptions rumen acidosis, diarrhea.
3. Very often hypochloremic, hypokalemic and need to consider hypocalcemia.

Routes of fluid administration

Parenteral

- IV administration.
- Complete replacement is more practical in neonates.

Enteral - Oral

- Enteral routes should be used in adult cattle when possible based on management and cost of IV administration.
- Hypertonic solutions can augment enteral routes.

- **First 4–6 h** : Corrective therapy
100–150 mL/kg BW

- **20–24 h** : Maintenance therapy
60–150 ml/kg BW/24 h intravenous
or oral

Fluid therapy

- Quantity
 - Rate of fluid therapy
- Routine @ 10-20ml/kg

RATE

- CALVES : 50- 80 ml/kg IV
response in 30-60min
- Cattle : 30ml/kg IV

Rapid IV fluid administration



Fluid Therapy



Parenteral Therapy

➤ Crystalloids

Solutions contain small particles that pass easily from the bloodstream to cells and tissues

➤ Colloids

Isotonic solutions

- 280 to 300 mOsm/litre
- Expand circulating volume and replace actual fluid losses

Isotonic Solutions for parenteral use

- **Normal Saline** : (0.9% NaCl) isotonic and provides Na^+ and Cl^-
- **Ringer's solution** : Isotonic and provides Na^+ , Cl^- , K^+ and Ca^{2+}
- **Ringer lactate solution** : Isotonic and provides Na^+ , Cl^- , K^+ , Ca^{2+} and lactate
- **DNS (5% glucose and 0.9% NaCl)**: provides Na^+ and Cl^-

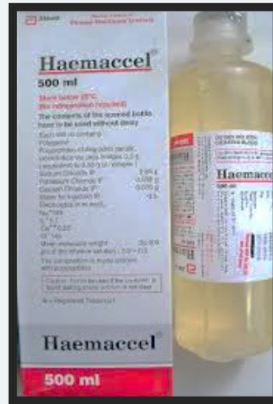
Colloids

- Large molecules
- Plasma volume expanders
- Require less volume
- Blood / albumin

Colloids



Dextran



Gelatin

Colloids



Blood transfusion

Oral restoration of fluid in cattle



Oral restoration of fluid in cattle



ORS in cattle



Infusion pump

ORS – Standard

Adult cattle

Sodium chloride	-	160 g
Pot chloride	-	20 g
Cal chloride	-	10 g
Prop. Glycol	-	300 ml
Water	-	20 l

Calf

Sodium chloride	-	4 g
Pot chloride	-	1 g
Sodium acetate	-	4 g
Dextrose	-	10 g
Water	-	8 l

ORS

- 7 g of NaCl
- 1.25 g of KCl and
- 0.5 g of CaCl₂ per
- 1 L of water
- 120 mmol/L of NaCl 16.8 mmol/L of KCl 4.5 mmol/L of CaCl₂
- Osmolarity of 287 mOsm/L
- Rumen volumes : 13 to 17% of bodyweight
- 50-65 litres

ORS – Impaction

- Magnesium oxide - 500 g
- Water - 5 l



ORS



DETAILS

- ▶ Bullock
- ▶ Not passed dung for a period 6 days
- ▶ Anorectic
- ▶ R/E:
 - Mucus,
 - Absence of dung

Dung



Before treatment



After treatment

Calf – ORS

► Calves : < 8 %

Oral electrolyte solutions

2.5 g NaCl

1.5 g KCl

5.0 g Sodium acetate and

28.0 g Dextrose diluted in 1 L water

- 2 Liters ---- 3-4 times a day

ORS – Recumbent cow

Downer cow syndrome

- Sodium chloride - 44 g
- Potassium chloride - 180 g
- Water - 24 litres



Thank you