



Forage Quality in Today's Dairy Rations

Importance of Dry matter intake

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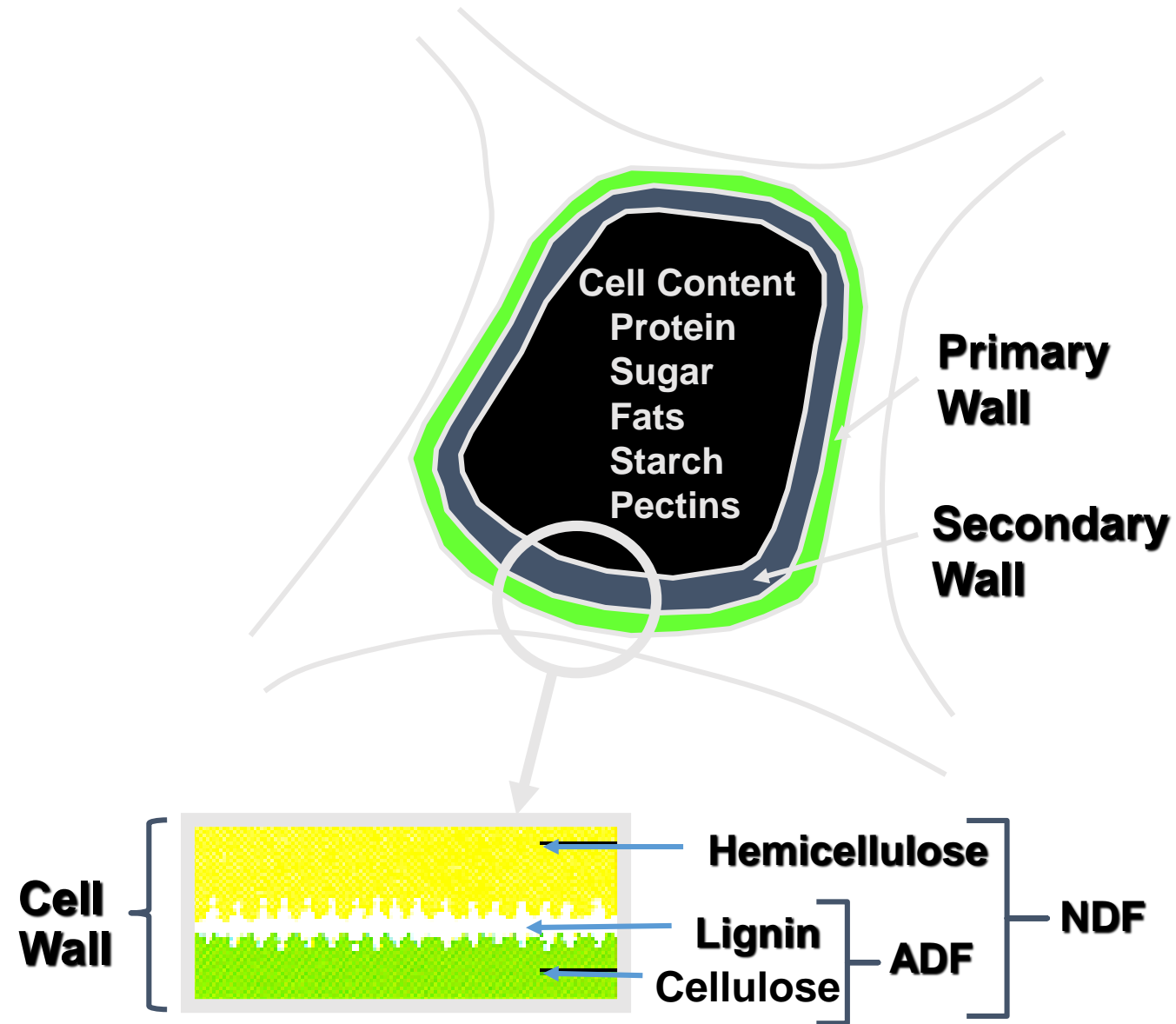
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Role of Forages

- Cheapest source of nutrients
- Major portion of the ration (50 to 80%)
- Maintain rumen health and function
- Fiber (nutrient source) for microbes



Diagram of a plant cell showing cell wall structure



Forage Quality Factors

- Leaf to stem or grain to stalk ratios
- Stage of maturity
- Harvest losses
- Soil fertility
- Growing conditions
 - sun
 - temperature
 - water

Increasing Forage Intake

(60 to 70% to ??? Total DMI)

- **Reduce feed costs**
- **Sustainable on-farm resource**
- **Quality controlled by the dairy manager**
- **Healthy rumen environment**
- **Selection of high yield and high NDF digestible forage hybrids (energy)**
- **Reduce cereal grain use (human and fuel competition)**

Forage NDFD

Represents the digestibility of the cell wall of your forage (NDF or neutral detergent fiber)

NDFD Lab Procedure

- Incubating feed sample with rumen fluid (microbes) with buffer
- Specific length of time (24 – 30 – 48 hr)
- Lab results will vary; use same lab
- NIR analysis is acceptable

NDFD: An Index of Dry Matter Intake

- One unit change in NDFD equals **0.12 kg (0.26 lb)** of dry matter intake
- One unit change in NDFD equals **0.21 kg (0.47 lb)** of fat corrected milk

Oba and Allen, 2005

NDFD Range Summary

	Average	Range
Mixed Hay	47	32-62
Legume Hay	46	32-61
Grass Hay	55	38 -73
Mixed Haylage	42	25-60
Legume Haylage	42	25-58
Grass Haylage	61	51-72
Corn Silage	60	48-71

Rumen Fill Dynamics from Dr. Grant



Using uNDF in Ration Evaluation

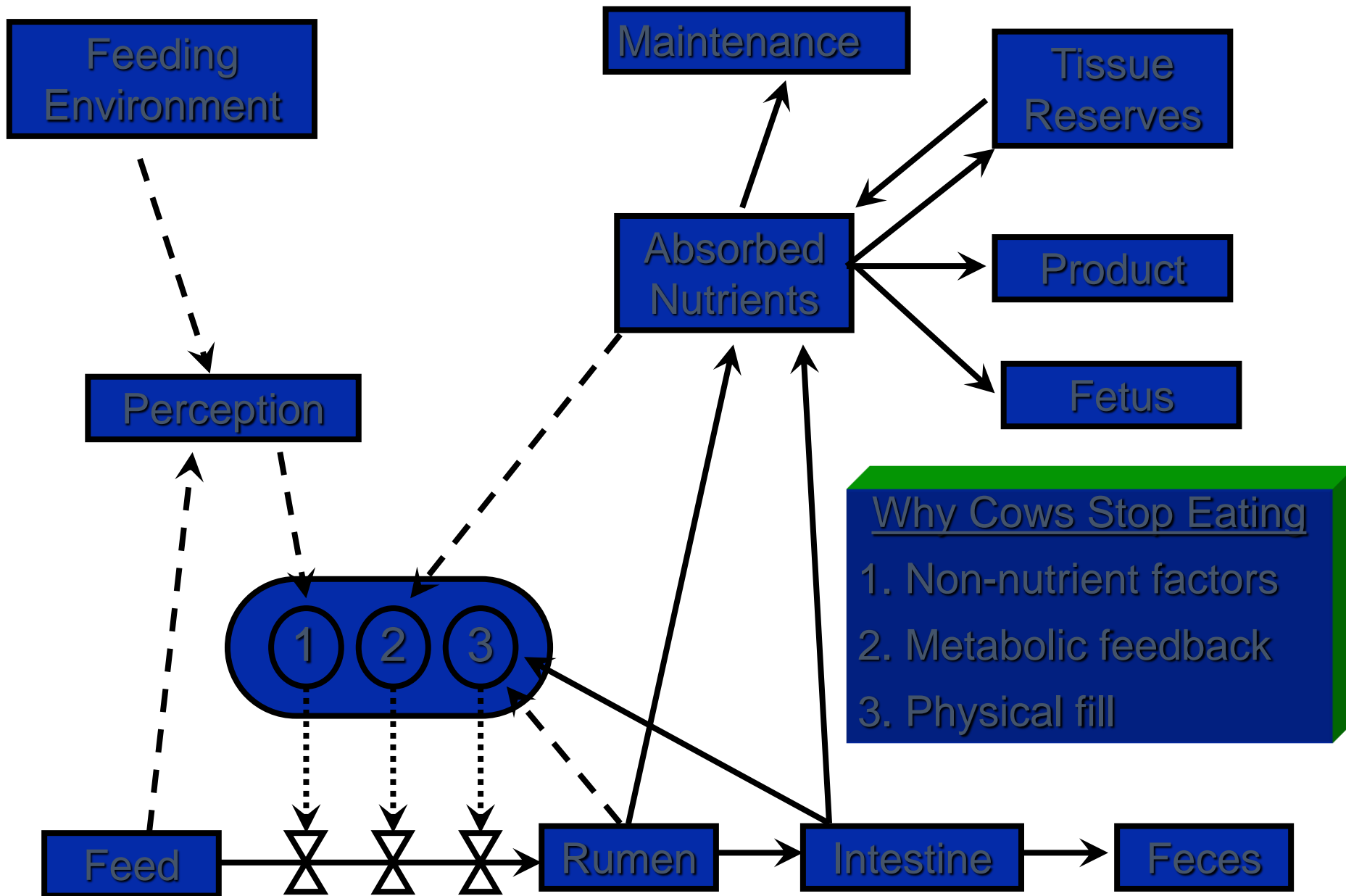
- Determines rumen fill from forage sources and/or minimal rumen fiber function (straw effect)
- Suggestion is 0.35 to 0.40 percent of body weight
- Guideline is 2.3 to 2.5 kg of uNDF-30 (Holstein) and 1.8 kg uNDF-30 (Jersey) from forage
- Questions on by-product feeds such as fuzzy cottonseed, soy hulls, citrus pulp, beet pulp, etc.

Role of Dry Matter Intake and Forages



Dry Matter Intake Is Key

- 1. Dry matter drives rumen function**
 - a) Yield of VFA (energy)**
 - b) Microbial protein yield**
- 2. Dry matter impact energy intake; forages sets the bar on DMI**



Dry Matter Intake

(NRC 1989)

Milk yield (kg/day 4%FCM)	Body weight (kg)			
	440	500	600	700
	kg DM / day			
22	14.5	15.9	17.3	18.1
33	17.7	19.5	20.9	22.3
44	21.9	23.2	24.1	25.0
50	--	26.8	28.2	29.6
60	--	--	32.3	33.6