

Fodder quality and its impact on animal value chains in Faisalabad, Pakistan

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Outline

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- 2. Hypothesis**
- 3. Materials and methods**
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- 5. Time plan**
- 6. Possible Outcomes**
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1- Introduction of the problem and research aims



Share in GDP

- 21% share of agriculture and livestock alone contributes about 12%.
- Green fodder is the most valuable and cheapest source of food for livestock.
- Total cropped area of 23.51 mha only 2.35 mha is under fodder crops.



Current situation

- Demand of milk and its products is rising
- No natural pasture suitable for grazing so dairy stock, mostly buffaloes, relies on cultivated forage
- Large numbers of dairy stock are kept in and around the cities and fodder have to be brought in from villages
- Low milk yield, less reproductive efficiency, delayed maturity and poor animal growth rate are major constraints due to imbalance nutrition.
- Provision of balance nutrition can perk up the animal productivity up to 50 per cent with the existing gene pool



Livestock production in Pakistan

- Rural household where animals are closely integrated with the rural subsistence economy
- Large herds (mostly small ruminants) kept in rangelands where livestock feed include all vegetation grazed and browsed by animal



Sources of forage

- Fodder Crops
- Crop residues
- Grazing of rangelands
- Wastelands
- Canal bank
- Road sides
- Crops and their by products



Effect of fodder on milk production

- 80-90 % of nutrients requirements of livestock are met from the fodder crops
- With quality nutritional fodder, milk production can be increased up to 100 %
- The area under fodder crops has reduced during the past decade.



Livestock feed Deficiency in Pakistan

- The present fodder supply is one third of the actual needs
- 21 % of total **dry matter (DM)**
- 33 % of **crude protein** requirements
- Green fodder is not available in sufficient quantities especially in extreme hot months.
- There are two lean periods for fodder:
 - (June-July) extreme hot
 - (December-January) extreme cold
- Majority of the animals thus remain under fed



Organic Farming

- Inorganic fertilizers may not replace trace mineral elements in the soil
- Organic fertilizers can improve the biodiversity and long-term productivity of soil

(Butler *et al.*, 2008)

- Inorganic fertilizers and pesticides used for fodder production cause toxins in animal products

(Walters, 2008)



Effect of quality feed on animal products

- Quality of feed fed to animal largely effect to products of animal in terms of milk and meat
- Constituents of the fodder may affect the biochemistry of the ruminant and so develop flavors or off-flavors
(Cowchie, 1953)
- Flavor of milk fat is influenced by altering the feed of the lactating animal for a few days
(Urbach, 1990).
- Quality of fodder and forage depending on natural environment and agricultural practices can alter the cheese characteristic
(Martin *et al.*, 2005)



Main constraints

- Growing pressure of human population
- Shortage of irrigation water
- Less and erratic rainfalls
- Low priorities to fodder production
- Imbalance use of fertilizers
- Improper management during two lean periods i.e. June-July and December-January



Objectives

Keeping in view the constraints, major objective of the study will be:

- Improvement of production and quality of fodder, to **overcome the gap** between fodder production and requirement.
- Improvement of **animal value chains** by providing good quality fodder



2-Hypothesis

- Quality of fodder has direct effect on animal product in terms of milk and meat.
- By improving the quality of fodder we can improve the animal value chains.



3-Materials and methods

1- Base line survey

- First of all fodder markets in Faisalabad will be visited to identify the areas and farmers that provide fodder to the market. Then these farmers will be interviewed based on a [structured questionnaire](#)
- Interviews will include
 - Socio economic aspects of the farmer
 - Crops grown by the farmer
 - Agricultural practices
 - Problems faced by the farmers



3-Materials and methods

2- Field experiment

Field experiment will be conducted in the experimental fields of the University of Agriculture, Faisalabad, Pakistan

2.1- Experimental design

Experiment will be conducted in **Completely Randomized Design (CRD) with two factor factorial.**

2.2- Factors

1- **Fertilizer**

2- **Fodder type**



3-Materials and methods

1- Fertilizer

i- Control

In control conditions **no fertilizer** will be applied.

ii- Animal dung

In this treatment **N,P,K** contents of dung will be determined and then this will be applied according to the N,P,K requirements of the crop

iii- Coraling

Quantity of dung and urine excreted by one animal (buffalo) per day will be measured and N,P,K of **dung and urine** will be determined and then animal will be kept in field for calculated time.



3- Materials and methods

iv- Chemical fertilizer

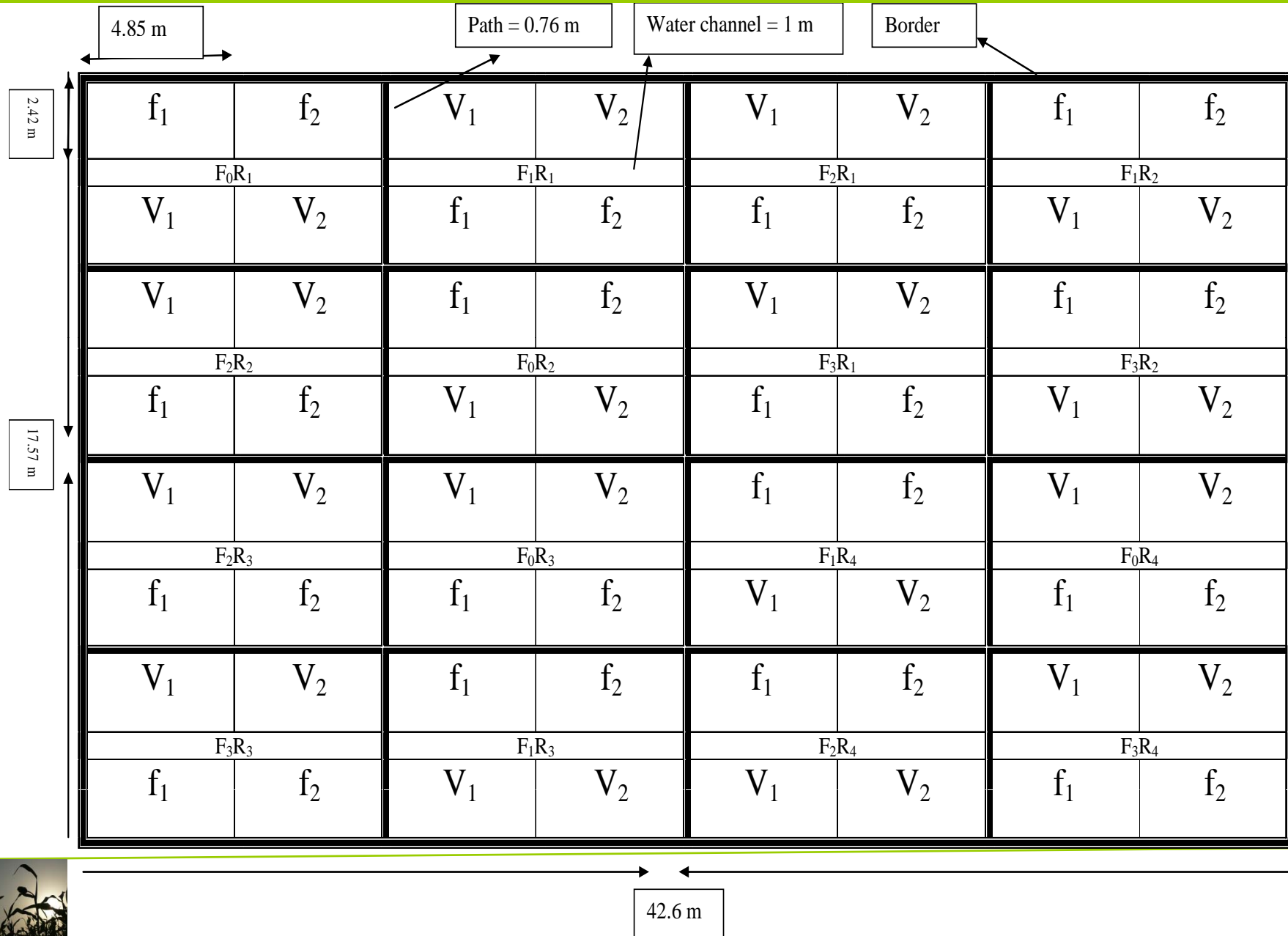
Chemical fertilizer will be applied to the field according to standard requirements of the crop

2- Fodder type

Two types of fodders will be used for the experiment. Fodder types will be selected from the base line survey



3- Materials and methods (Layout)



3- Materials and methods (Layout)

Design: CRD split plot design

Replication = 4 = R1, R2, R3, R4

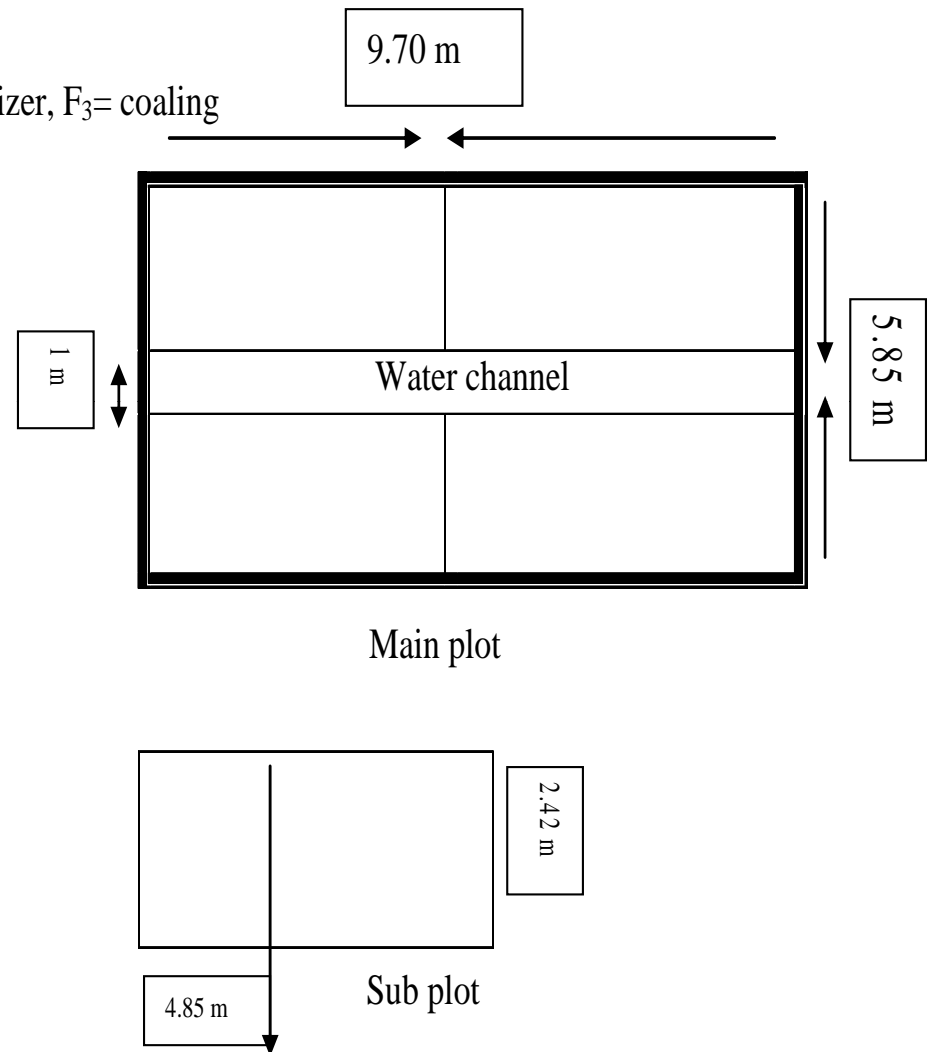
Fertilizer = 3 = F₀ = no fertilizer, F₁ = Animal Manure, F₂ = chemical fertilizer, F₃ = coaling

Fodder = 2 = f₁, f₂

Vegetable = 2 = V₁, V₂

- 1- Main plot: $9.70 \times 5.85\text{m} = 56.74 \text{ m}^2$
- 2- Sub plot = $4.85 \times 2.42\text{m} = 11.74 \text{ m}^2$
- 3- Path width = 0.76 m
- 4- Water channel = 1 m
- 5- Border = 0.76 m

So total area required for the experiment is = $23.19 \times 42.6\text{m} = 987.90 \text{ m}^2$



3- Materials and methods

2.4- Data collection

1- Yield related traits

Morphological traits

Phenological traits

2- Chemical analysis

Mineral analysis

Quality traits



4-Statistical analysis

All data collected will be statistically analyzed using appropriate statistical package.



5-Time plan

- Three months for literature and secondary data collection
- Three months for baseline survey
- Two years for field research
- Six months for data evaluation and publications and thesis write up



6- Possible outcomes

Possible outcomes of this research are:

- Availability of good quality fodder throughout the year
- Ultimately improvement in animal productivity and value chains



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Thank you for listening

