

Grazing systems on loess soils options at Huanxian

Nan Zhibiao, Hou Fujiang
Lanzhou University



Outlines

- **District description**
- **Farm survey**
- **Grazing experiment**
- **Energy balance**
- **Better options**
- **Other outcome**

1. District description



Research district

The map shows the outline of Gansu province with an inset map of China in the top-left corner. The research district is highlighted in a light green box at the top of the province. Major cities are marked with light blue circles: Yinchuan, Lanzhou, Xi'an, and Taiyuan. A yellow circle with a blue border marks the location of Tianshui. The map includes latitude and longitude coordinates: 105° E and 110° E along the top and bottom edges, and 35° N and 40° N along the left and right edges.

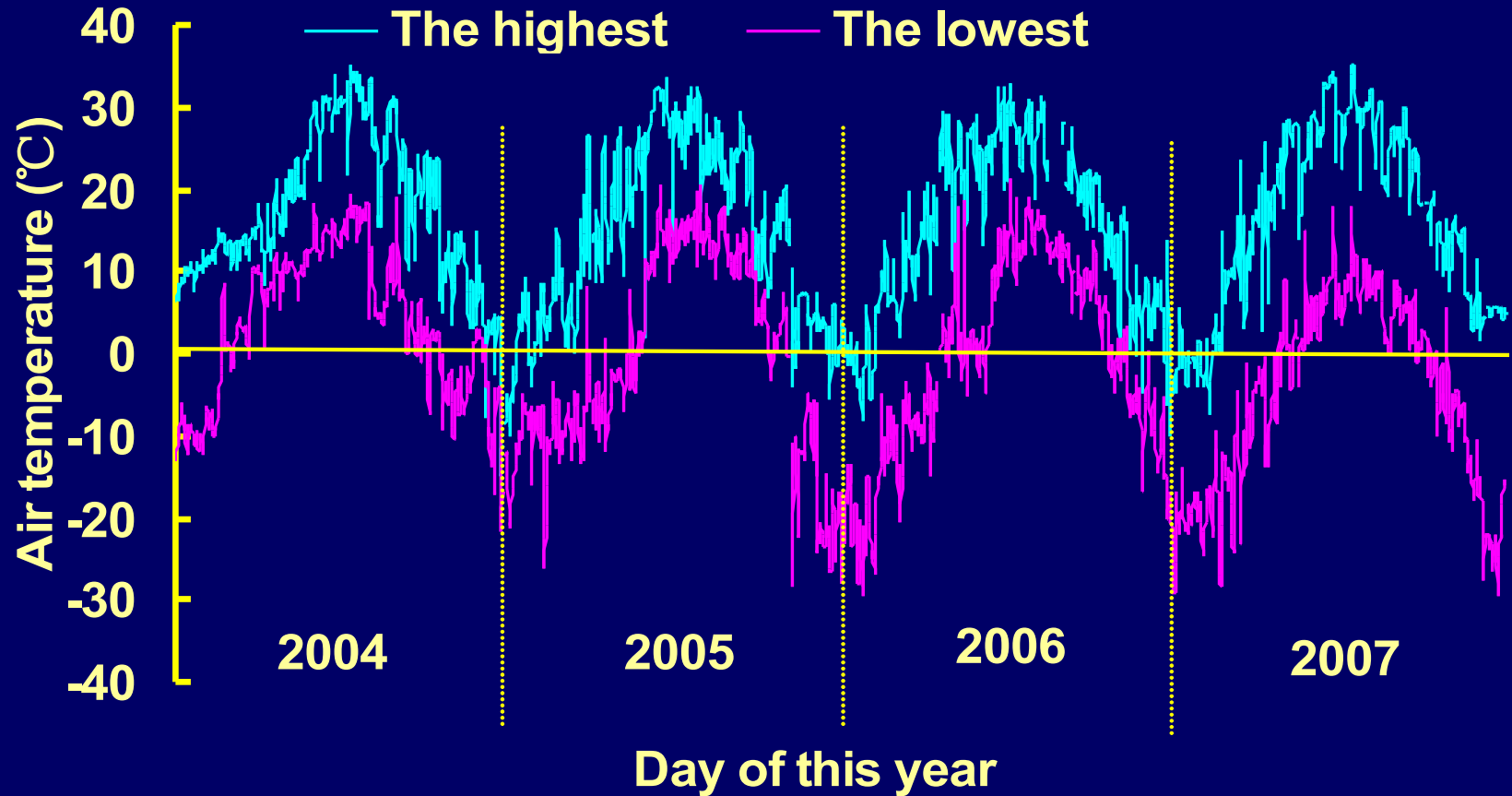
● Tianshui
Huanxian county
Gansu province

Hilly area

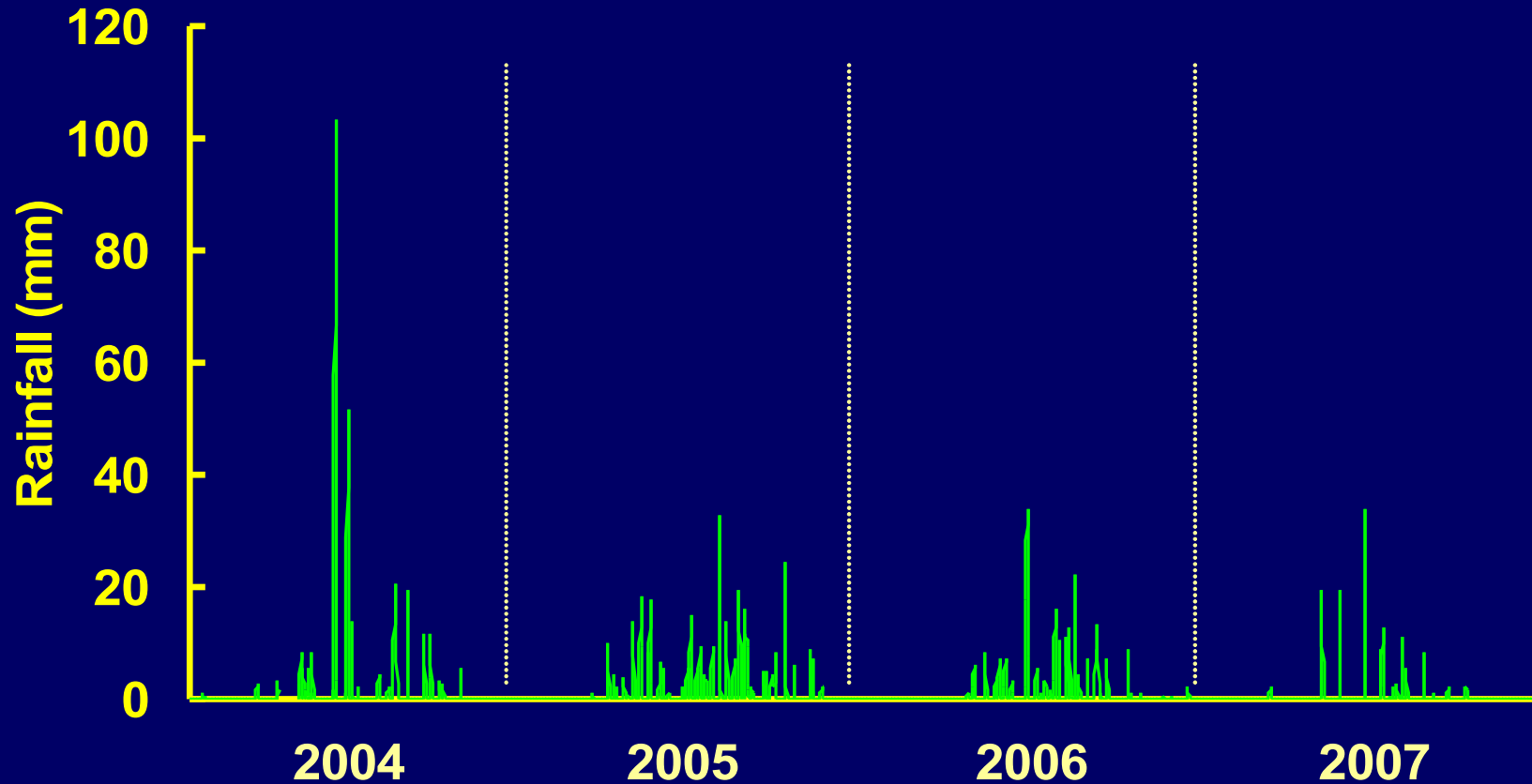
Loessial soil

**Typical steppe: *Stipa bungeana*,
*Lespedeza davurica***

Annual mean temperature 7.4°C



Annual mean rainfall 300 mm

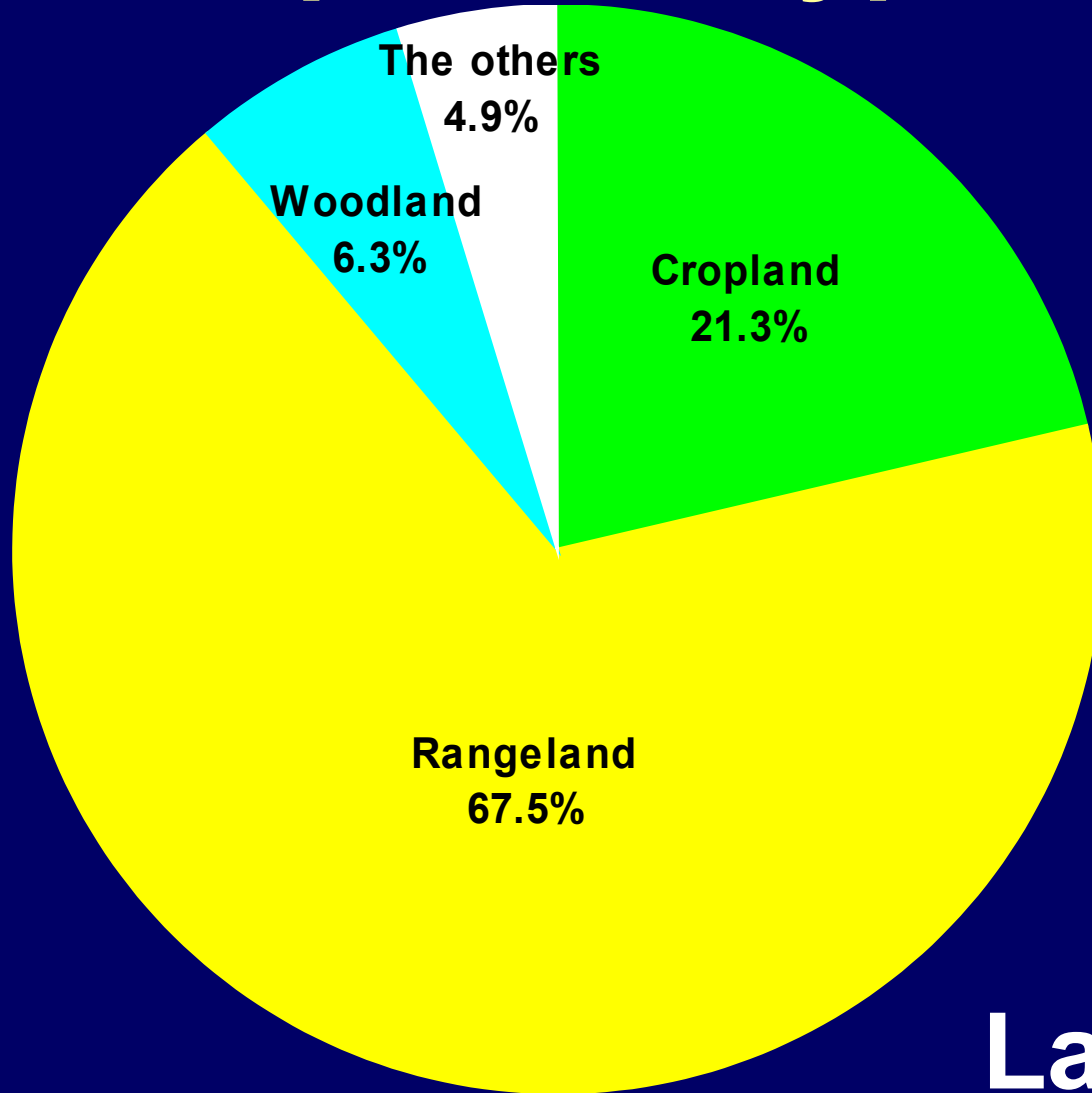


Serious degradation of rangeland

- 90-97% rangeland, 42-64% heavy
- Fertility loss: N 60-150kg/ha, P 90-225kg/ha, K 1200-3000kg/ha

2. Farm survey summary

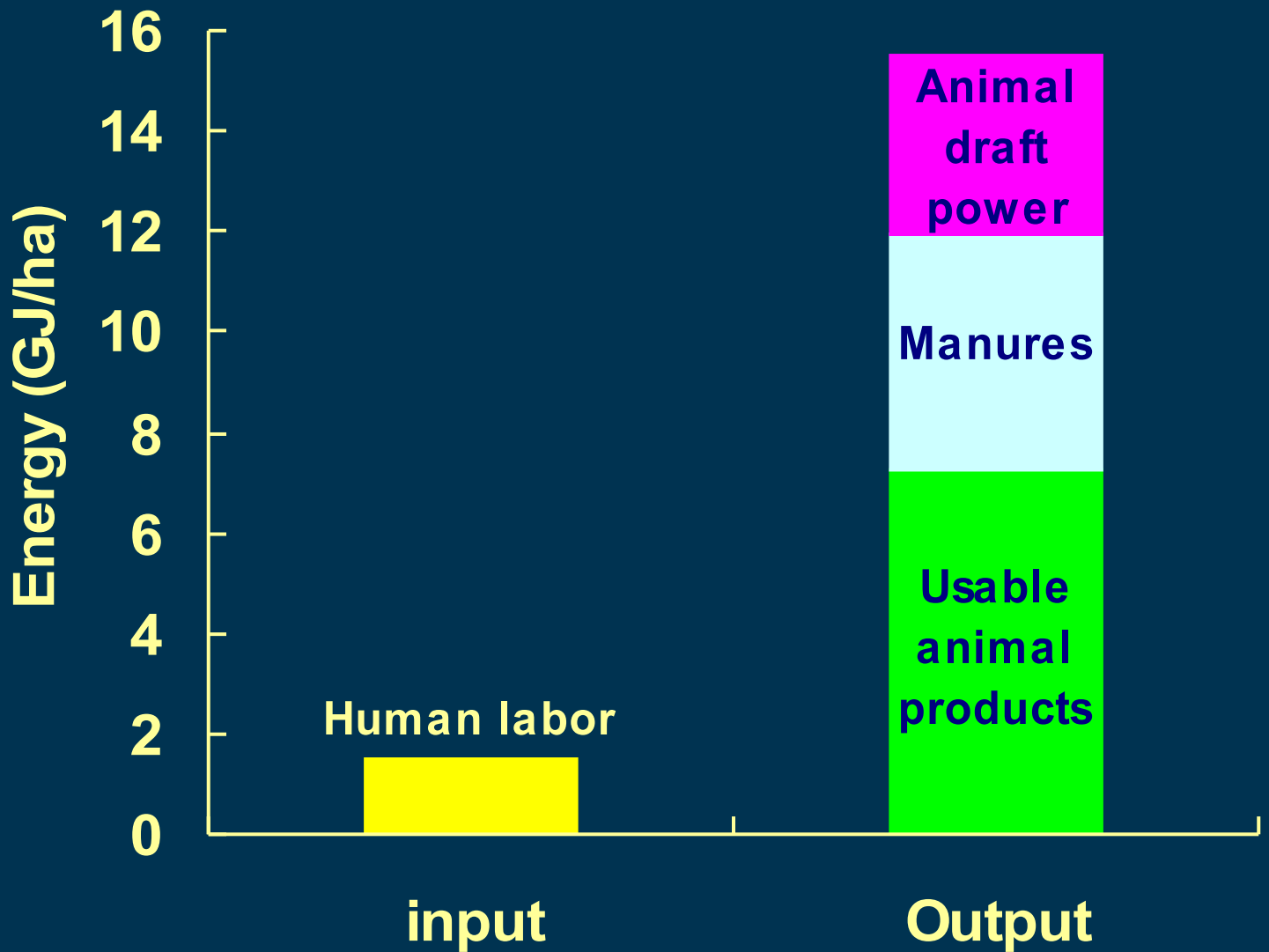
2.1 Description of typical farm



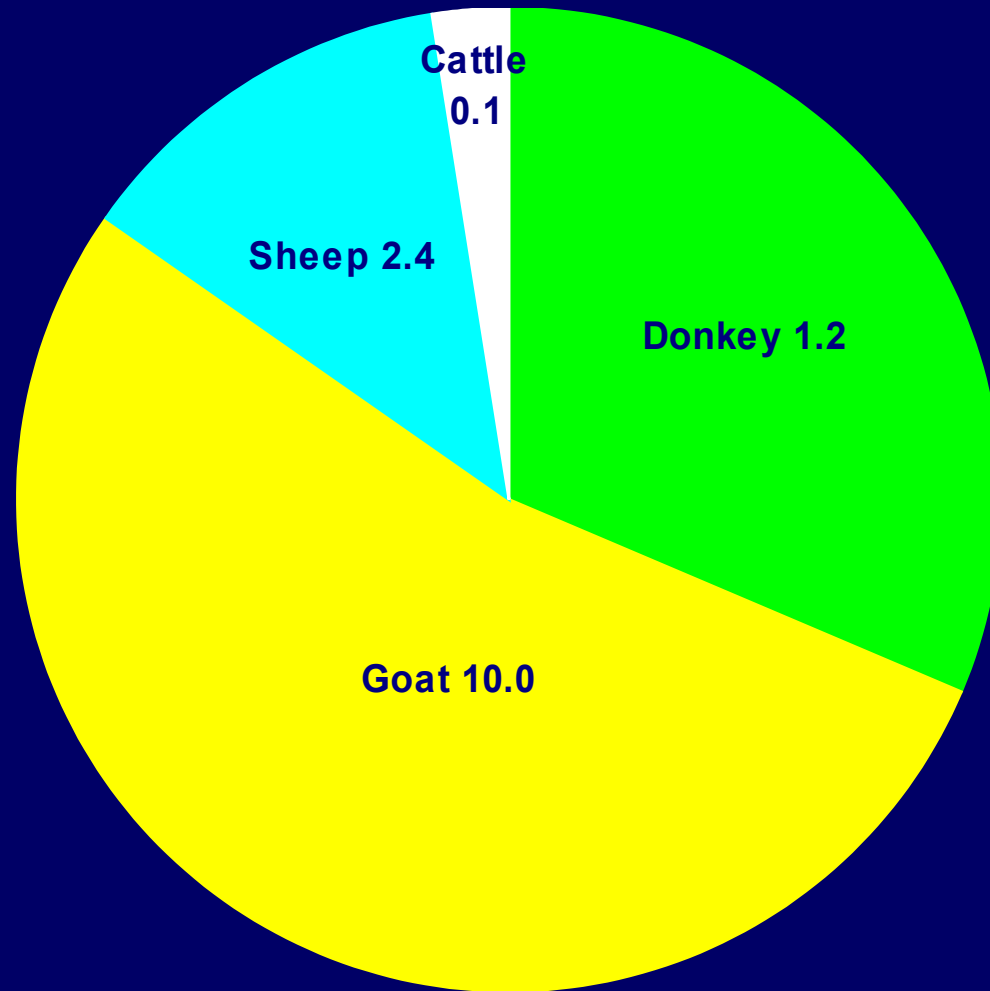
Land use

2.2 Rangeland condition

- **Communal grazing land**
- **High energy output / input ratio**
- **Meet 59.7% of energy demand of livestock**
- **Serious degradation**

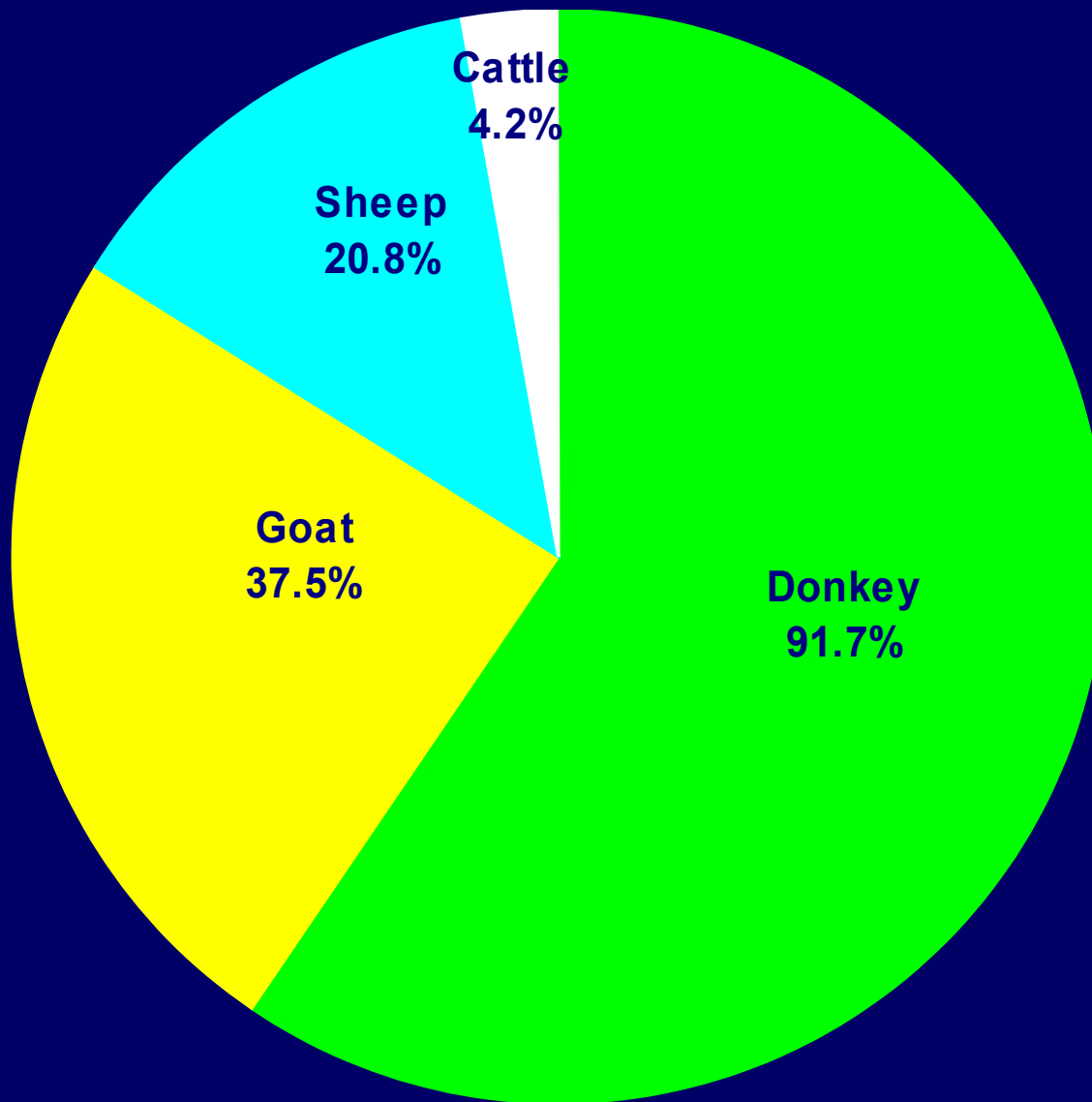


2.3 Animal number and condition



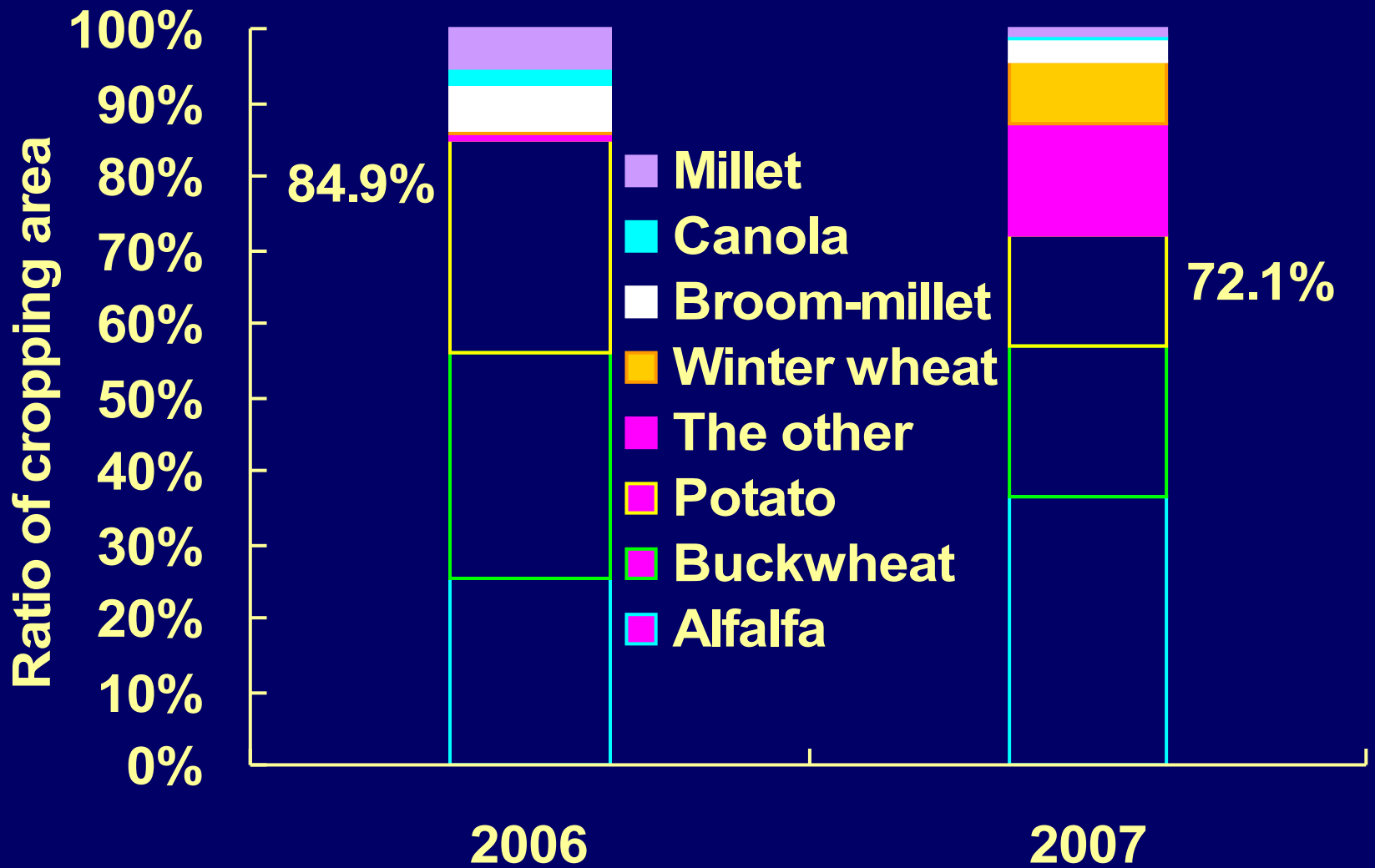
Animal number in farm

Number of farms with livestock

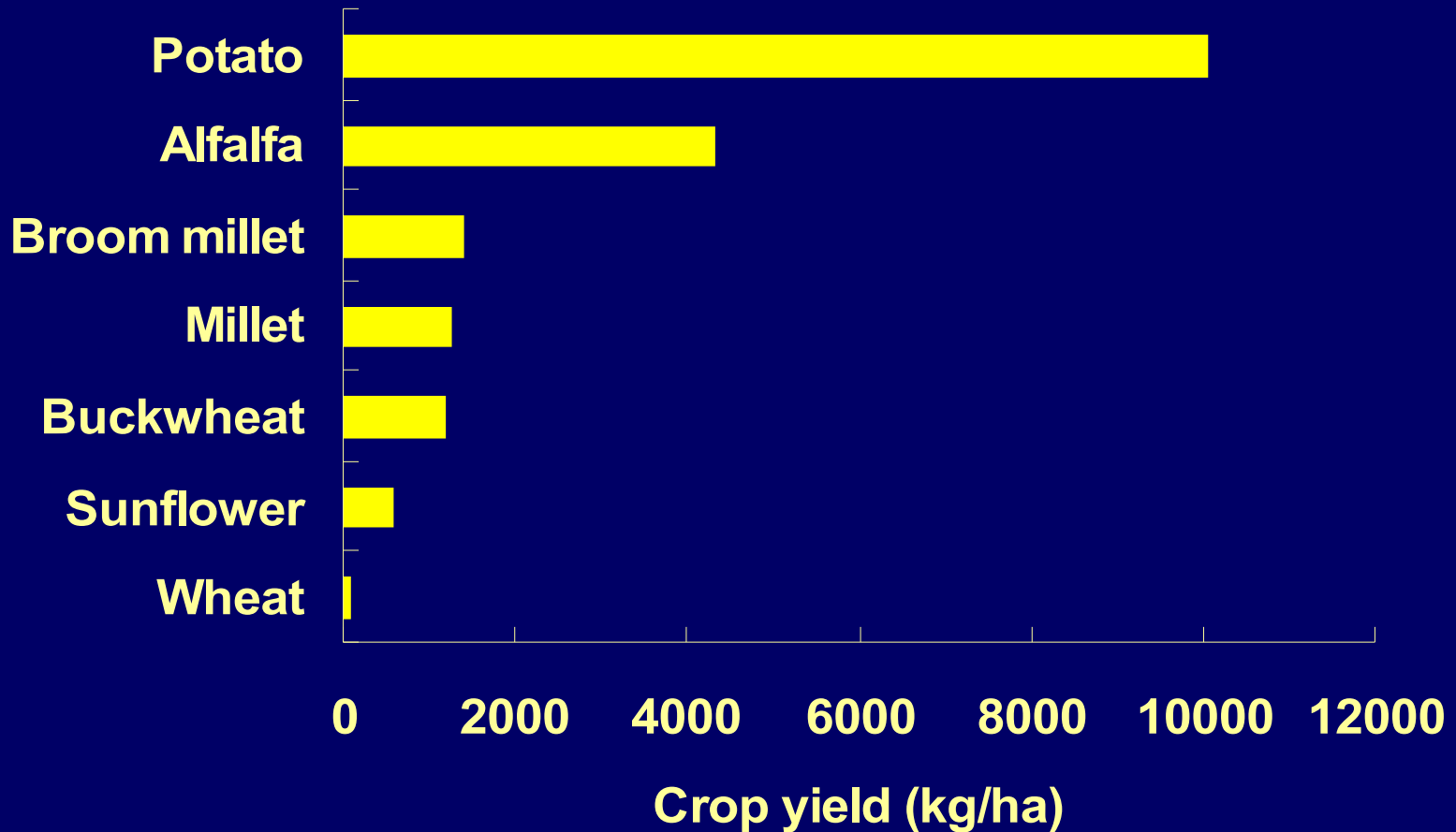


Contribution of livestock production to crop production

- 53.8% of draft power
- 49.6% of fertilizers
- 40.1% of net income



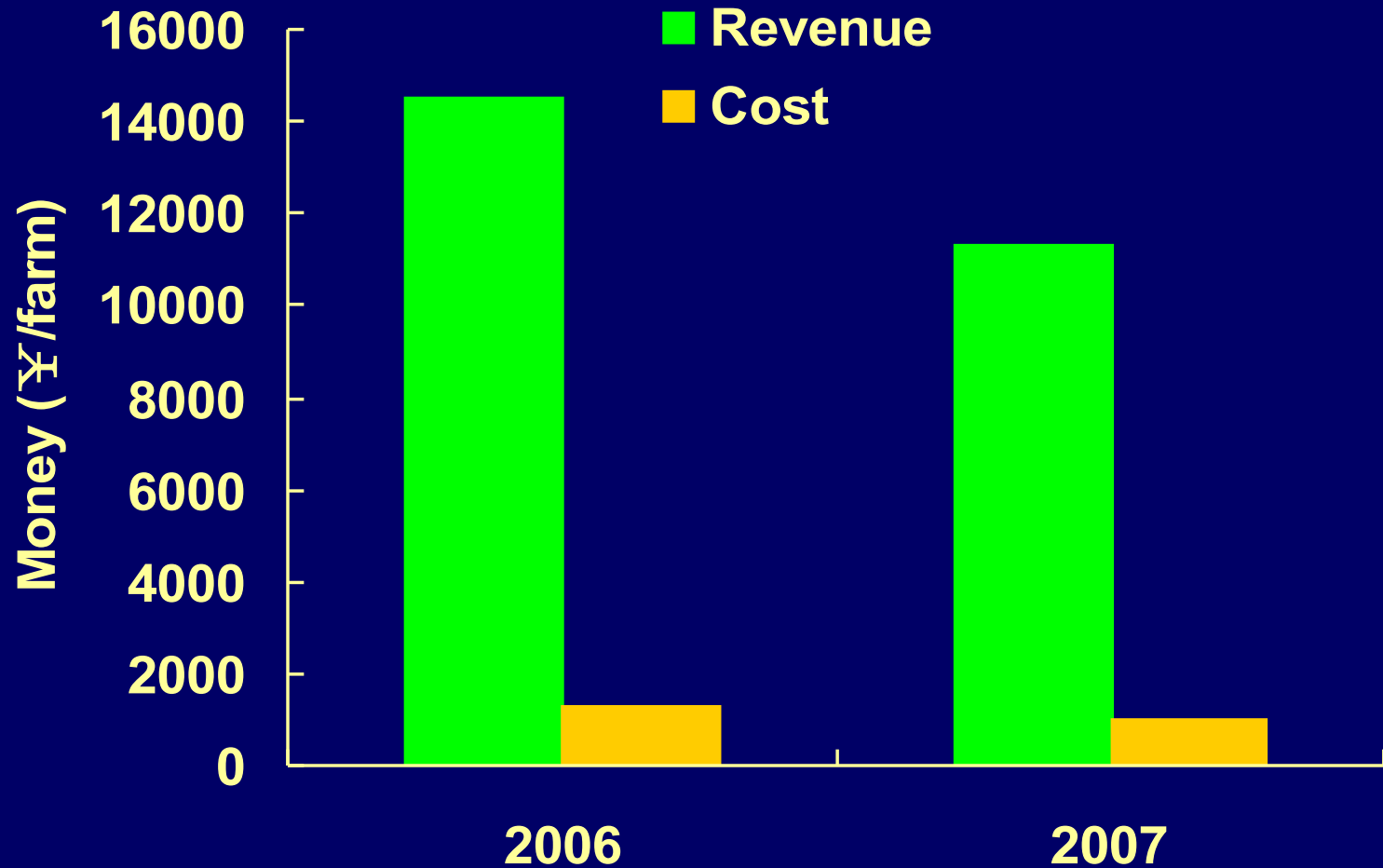
Crop yield



2.5 Household members

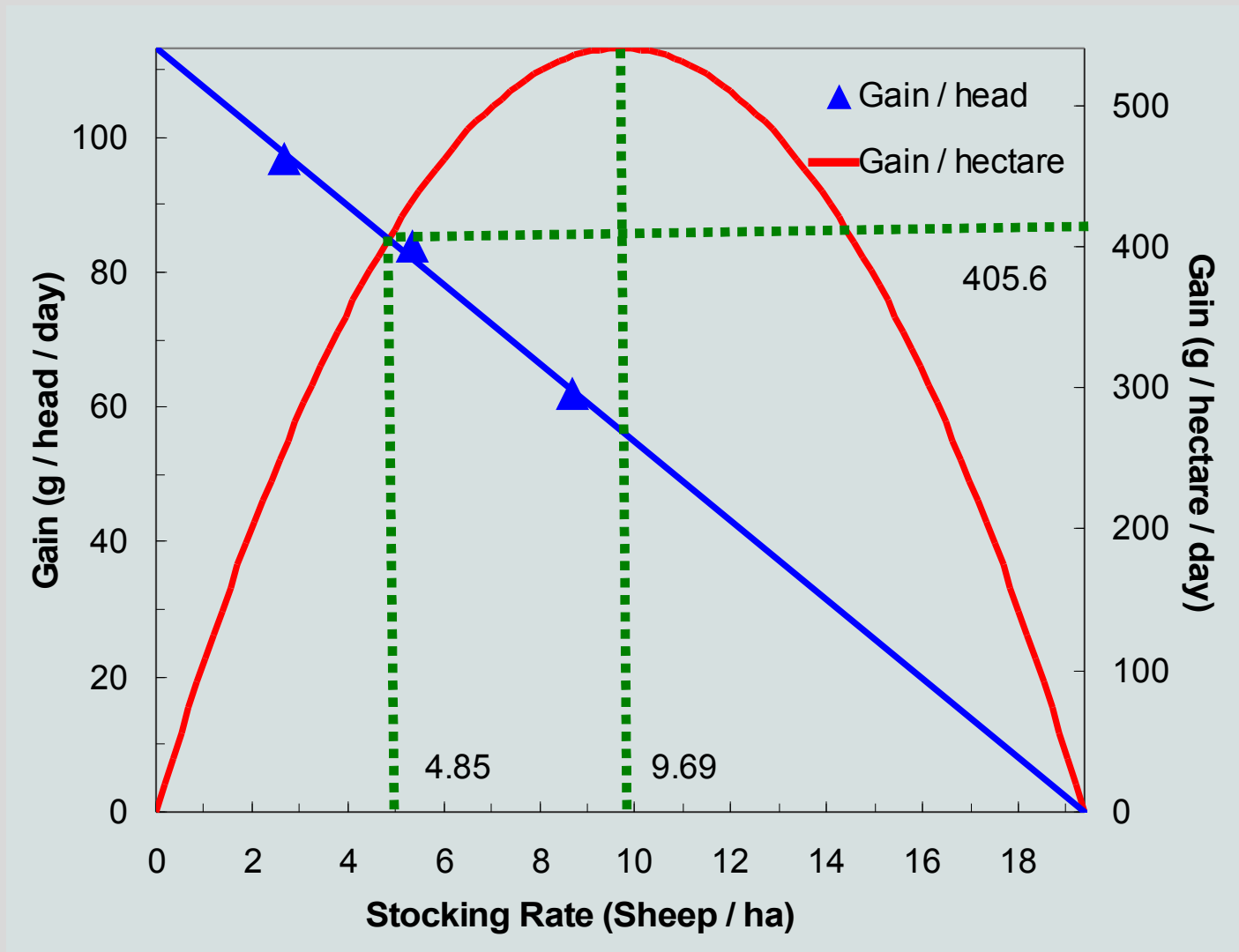
- **5.9 persons and 1.4 labors in each farm**
- **Human power input of each per year: 698.1 h and 474.0MJ for crop production, 1407.8 h and 588.5 MJ for livestock production**

2.6 Revenue and costs



3. Grazing experiment

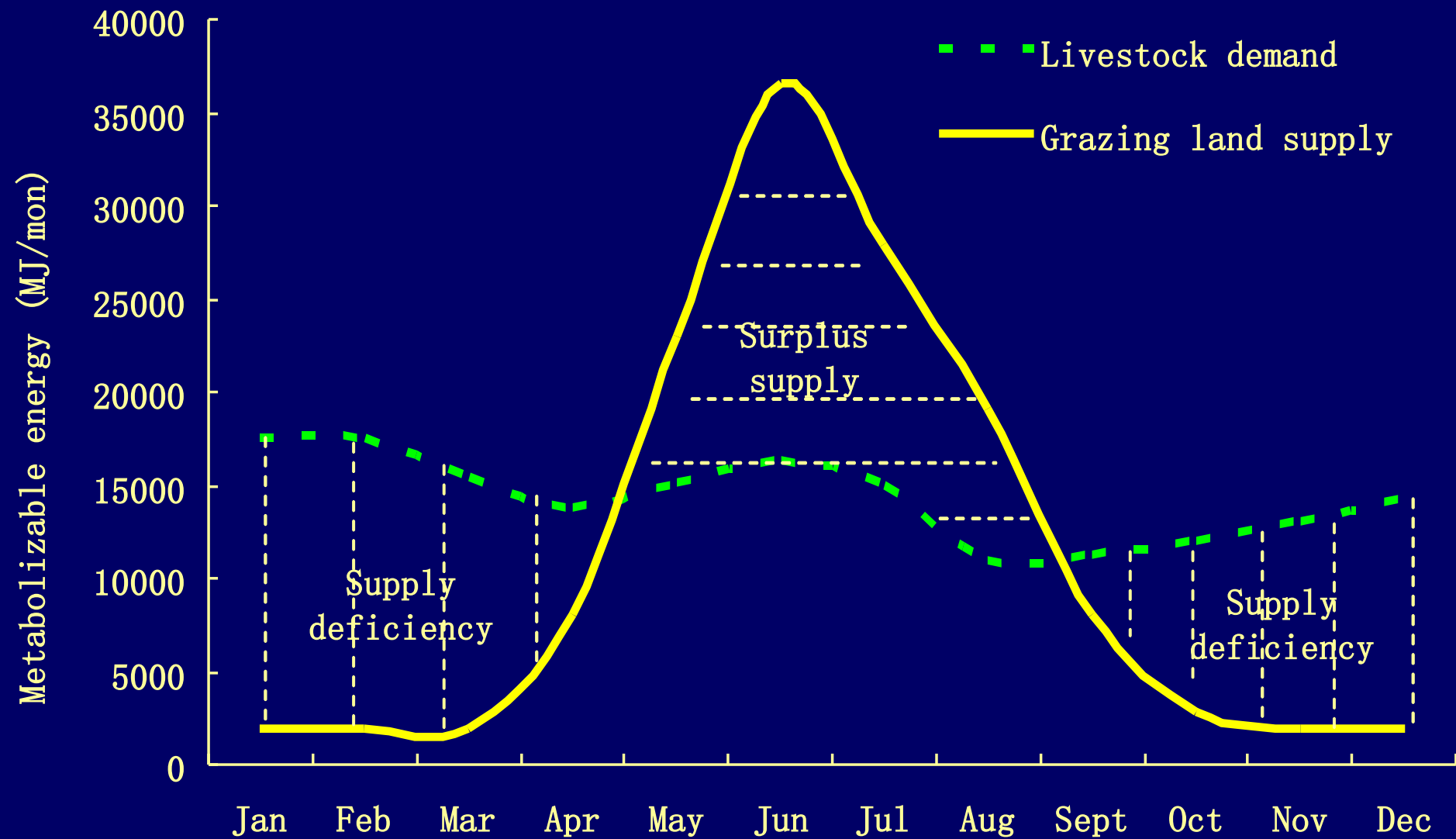
Tan sheep rotation grazing in summer



Proper stocking rate and maximum productivity

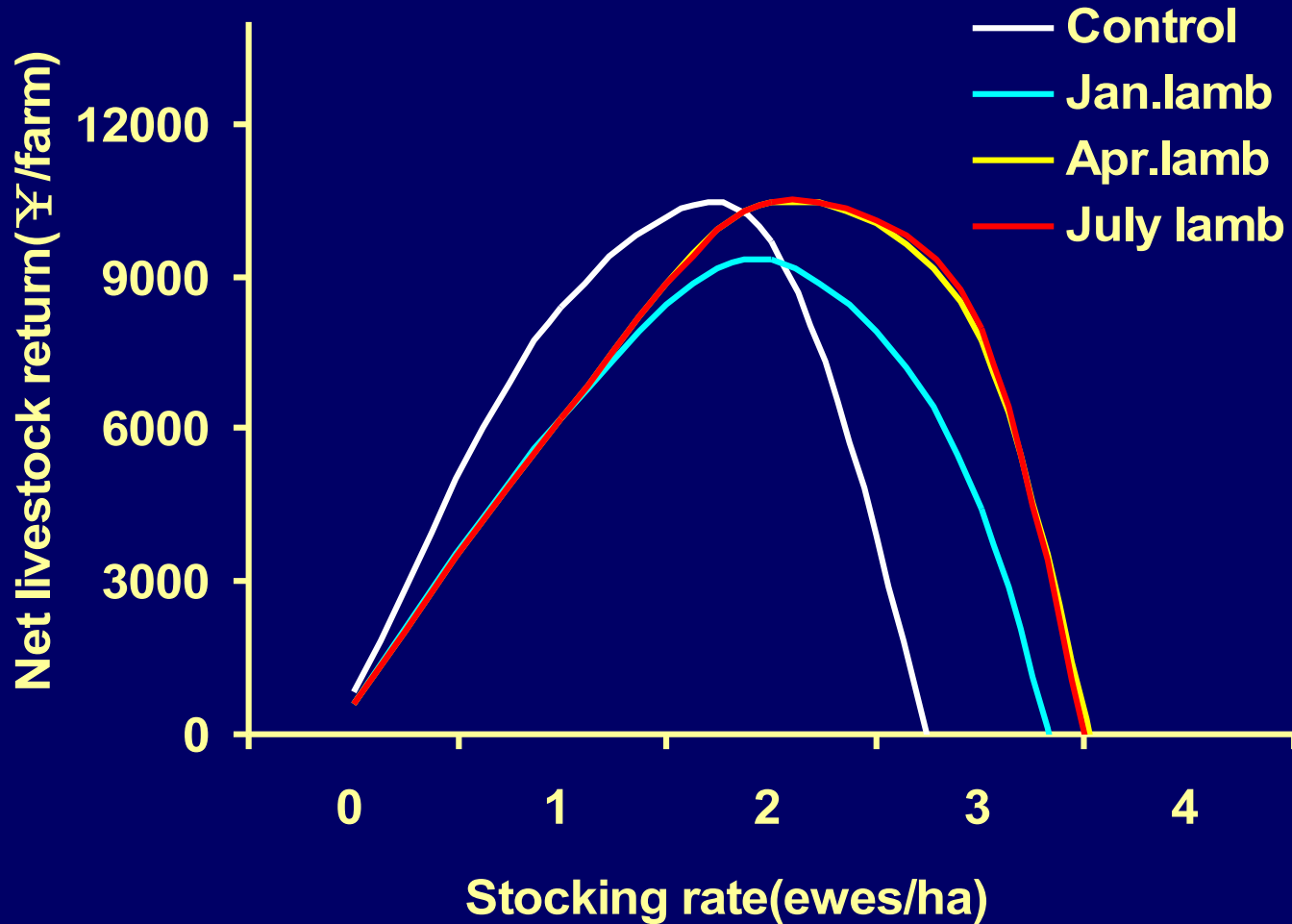
Year	Proper SR (sheep/ha)	Max Productivity (kg/ha)
2002	5.5	80.1
2003	4.3	86.9
2004	4.8	42.9
2005	3.7	36.8
2006	5.4	34.4
2007	4.7	33.7

4. Energy balance livestock production in typical farms

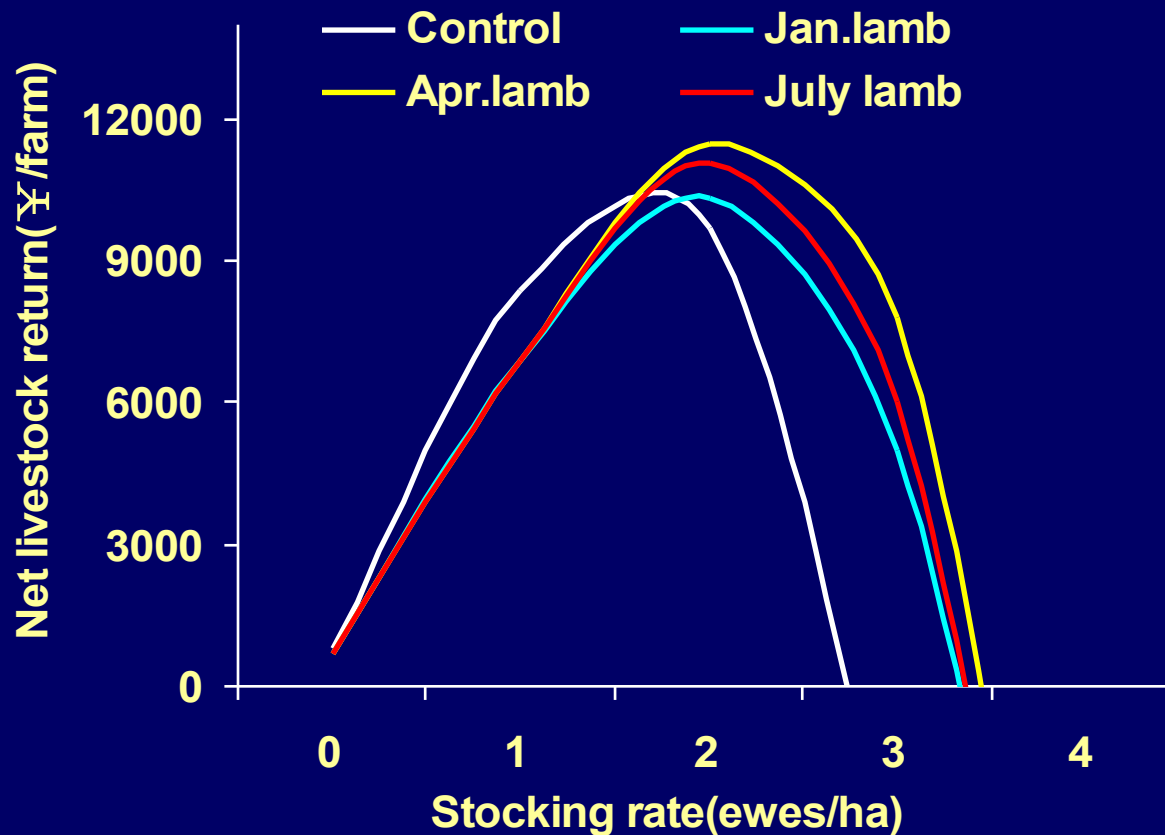


5. Better options for farm improvement

5.1 Lamb sale at 6months

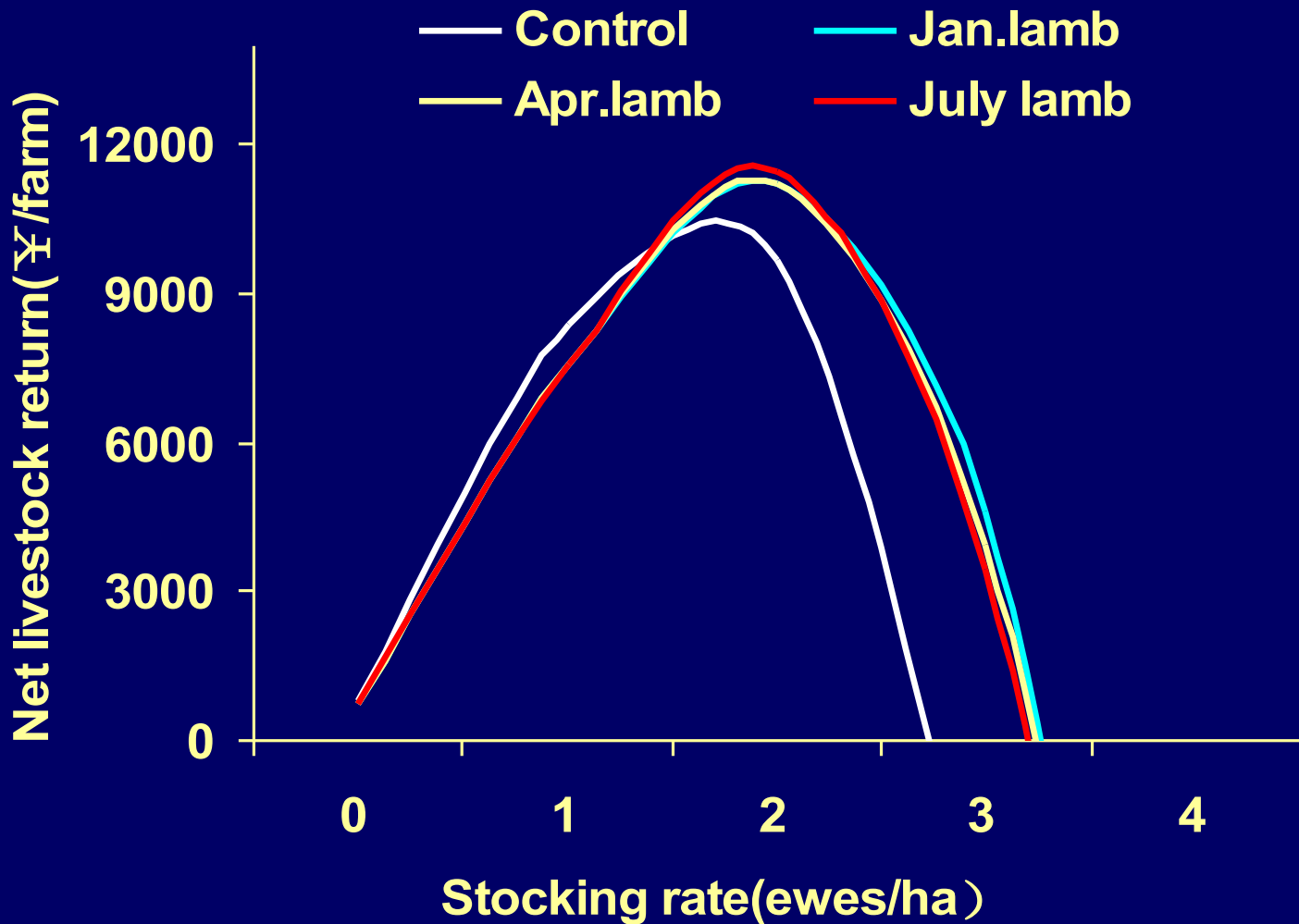


5.2 Lamb sale at 9months

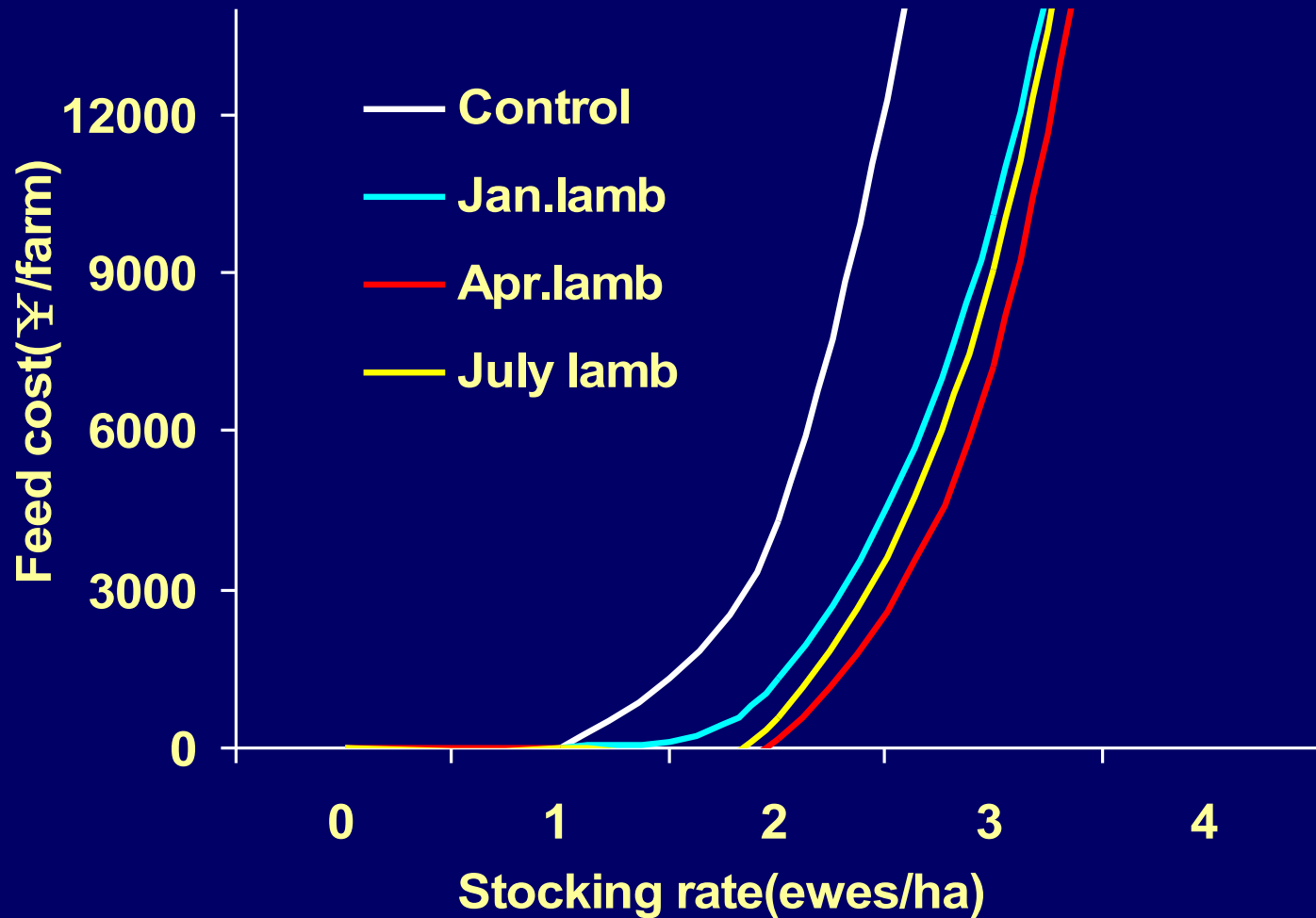


Net return

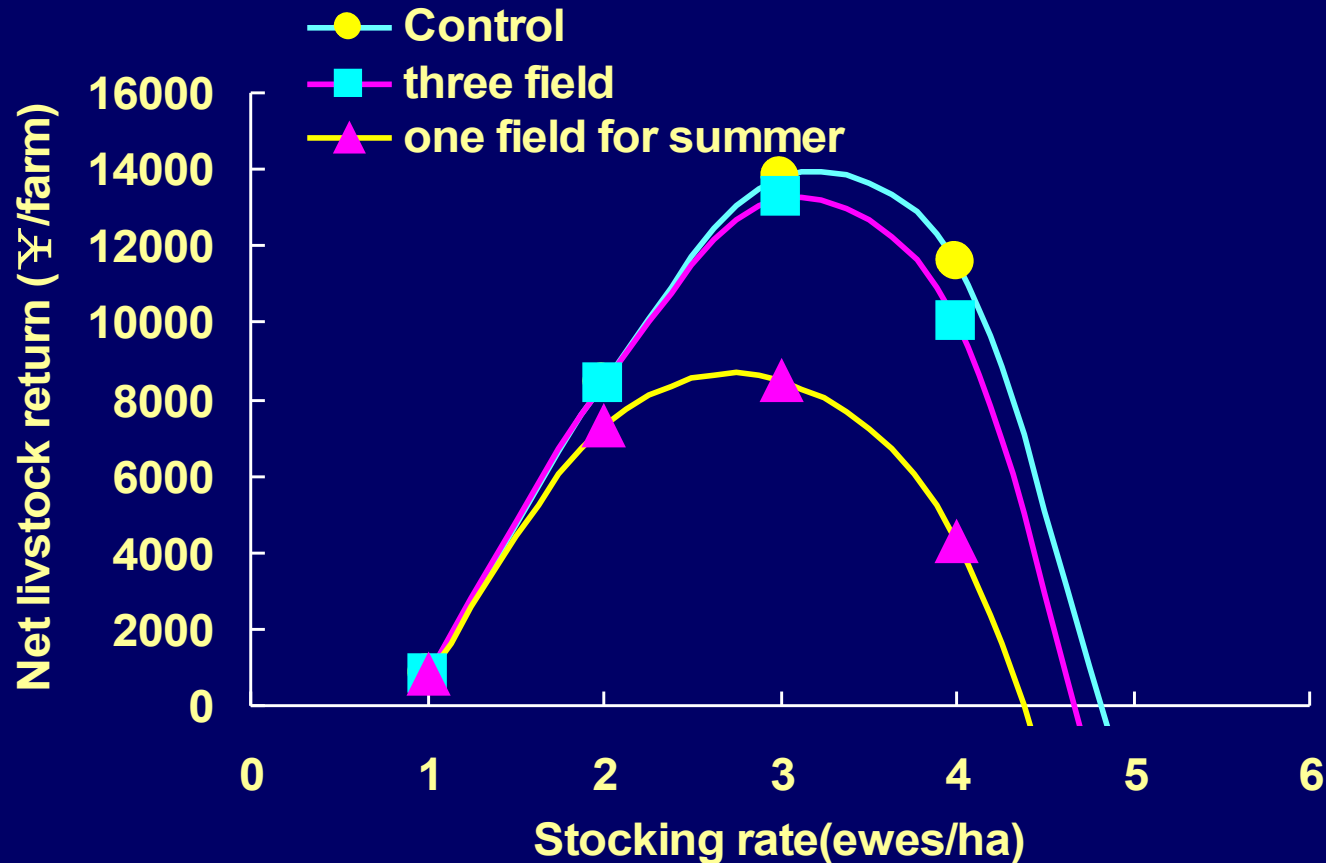
5.3 Lamb sale at 12months



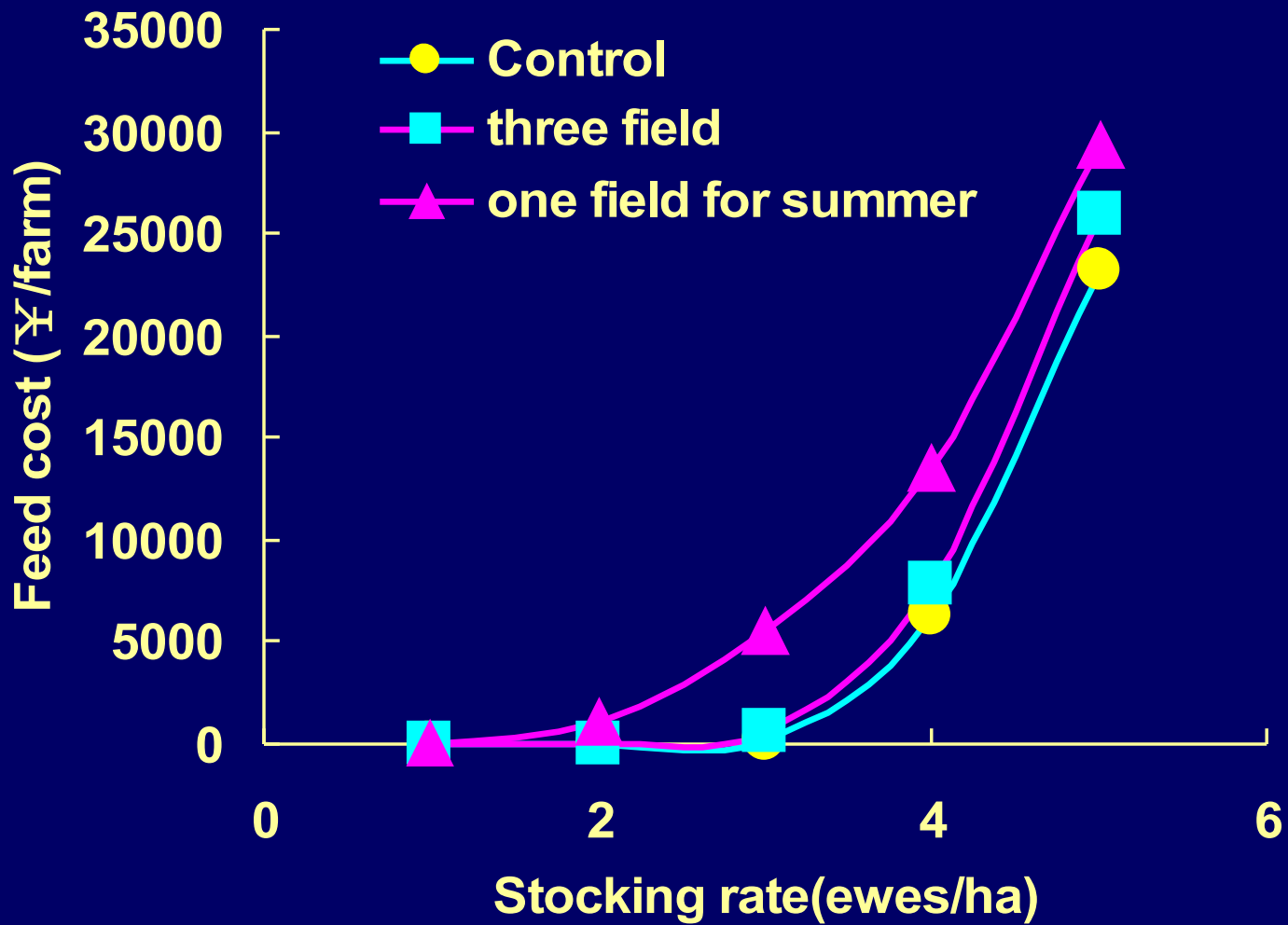
Cost



5.4 Change grazing methods



Net return



Cost

6. Other outcome

- **Improvement of grazing management**
- **More sown grassland**
- **Increase in income of farm**

Thank you!