

## **Framing effect and pastoralist decision making behavior regarding lambing time-an analysis from Inner Mongolia, China**

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### **Introduction**

Grassland is the largest terrestrial ecosystem in China. However, it is seriously degraded. Lower stocking rates have been necessary for rehabilitating the degraded grassland. In order to rehabilitate the grassland the government proposed the “balancing animals and grass” policy. However, it has been resisted by pastoralists. (Brown *et al.*, 2009). The reasons for the policy’s failure have been widely discussed. To date, there has been a lack of discussion on explicitly addressing the role of pastoralist behavior regarding stock numbers and lambing time. The pastoralists continue to maintain their traditional stocking rate, and take short-term adaptive measures to balance their animal’s needs with feed supply.

Winter lambing is considered as one of efficient measures rehabilitating grasslands degradation. In northern China, however, those pastoralists generally buy little forage for sheep and lambs. Because they would graze the livestock, including lambs, on the grassland in the early growing season. However, early season growth on the grasslands is unpredictable and winter lambing could increase the grazing pressure and exacerbate degradation problems. If pastoralists have enough forage supply and sheds for stall-feeding, they could choose to lamb in winter and at the same time comply with the grazing-rest policy.

Under the Household Contract Responsibility System, the pastoralists hold the grasslands and breed livestock themselves, and their decisions have both direct and indirect impact on the balance between animal needs and forage supply. However, unpredictable markets and climate change result in pastoralists facing increasingly more decisions making about lambing time and buying forage. Thus, it is becoming imperative to understand how pastoralists make decisions and the biases they exhibit.

The framing effect is observed when a decision maker’s risk tolerance depends on how the alternatives are described. Many empirical studies have been conducted to demonstrate and investigate the framing effect in different contexts. Similarly, many theories have been developed to explain human decision making behavior based on gains and losses. However, little is known about pastoralist decision making behavior from a “framing effect” perspective, especially in pastoral areas of northern China.

Early research has indicated agricultural decisions vary substantially by ethnicity (Heinimann *et al.*, 2013). In northern China, the majority of pastoralists are with Mongolian background. They have their own culture, values and norms. While most Han pastoralists migrated from agricultural areas, generally take into account more economic interests when making decisions, More importantly, for all those pastoralists who livelihoods depend solely on grassland resources, stock-breeding not only supplies them with monetary income, but also many economic outputs. All these aspects have a substantial impact on pastoralists’ making decisions. Their decisions are an important factor to consider in policy formulation and implementation. However, the importance of ethnicity tends to be ignored in addressing grassland sustainability issues. The objective of this study is to explore the pastoralist decision-making behavior about lambing time, and to propose potential and efficient measures for controlling degradation problems for sustainable grassland development.

### **Materials and Methods**

Through a preliminary interview, we found that most pastoralists could not understand the experiment fully because of less formal education. Therefore, a controlled experiment was carried out to understand pastoralist decision behavior. Then a household survey was also conducted as an auxiliary method to explore the social reasons behind the decision behavior.

**Experiment:** Subjects were recruited from students majored in economics at School of Economics and Management of Inner Mongolia Agricultural University and Inner Mongolia University. All the subjects came from the pastoral areas of Inner Mongolia. A total of 120 undergraduate students voluntarily participated in the experiments on pastoralist decision making. The experiment was carried out referring to classic references of behavioral economics (such as Tversky and Kahneman, 1981).

**Household survey:** We selected Xinbaerhu Left Banner, Xilinhot and Sunite Right Banner as the study regions. Those three counties are located in meadow steppe, typical steppe and desert steppe regions, respectively, which comprise the dominant part of Chinese northern grassland areas. During July-September 2012, the survey was conducted in villages from these three counties. 60 households head in each county were interviewed. The questionnaire used in the experiment and household survey was as follows.

**Problem 1**

*If you choose to lamb in winter, you will be able to sell livestock before 30th, June. Thus, you will get government subsidy, which is 4-6 yuan/kg. Your choice is*

*A Lambing in spring      B Lambing in winter*

**Problem 2**

*If you choose to lamb in spring, you will not be able to sell livestock before 30th, June. Thus, you will fail to get government subsidy, which is 4-6 yuan/kg. Your choice is*

*A Lambing in spring      B Lambing in winter*

**Results and Discussion**

Nearly 60 % of our subjects suggested that they chose to lamb in winter (53 % of Mongolians and 65 % Hans). But does it make a difference whether lambing in winter is described as a choice to avoid the subsidies loss, or a choice to make more money? A nonparametric analysis was performed (Table 1). Overall there was a statistically significant framing effect. This is critically important from a policy perspective, since pastoralists are more prone to learn from their neighbors when the perceived profit from some new technology that their neighbors use is greater than when using the traditional method. When we disaggregate, we see a significant framing effect for Mongolian subjects. However, for Han subjects, we observe no significant change in decisions. The participants of Han background were more inclined to choose to lamb in winter than those of Mongolian background. Indeed, a part of households with Han background, have already chosen to lamb in winter. But our survey found that some pastoralists return to lamb in spring again because they lose money due to lack of stall-feeding technology training. This has important implications for policies. The grassland protection policies and programs are urgently needed to improve appropriate winter-lambing and stall-feeding technologies transfer. Furthermore, there are interesting differences between behaviors of different types of subjects.

**Table 1:** Proportions of pastoralists choosing to lamb in winter by different frames and ethnicity

	Winter frame	Spring frame	P value for difference
Mongolian	65%	40%	0.006***
Han	74%	55%	0.083
Overall	69%	47%	0.001***

Note: significant at 1%, 5%, 10% level is denoted by \*\*\*, \*\*, \* respectively.

**Table 2:** Determinants of decision-making behaviour regarding lambing time

Independent variables	Coefficients	Marginal effects of changes in variables
Constant	0.244	
	-0.2371	
Winter	0.610*	0.235*
0(1)=Spring(Winter)frame	-0.3484	-0.1298
Mongolian	-0.403	-0.155
0(1)=Han(Mongolian)	-0.2474	-0.0936
Winter x Mongolian	0.109	0.042
	-0.359	-0.1383
Female	-0.184	-0.071
0(1)=Male(Female)	-0.2471	-0.0956
Winter x Female	-0.141	-0.055
	-0.3585	-0.1411

Note: Standard errors in parentheses; significant at 1%, 5%, 10% level is denoted by \*\*\*, \*\*, \* respectively.  
N = 214; Prob >  $\chi^2=0.0047$ ; Pseudo  $R^2=0.0580$ .

A probit regression was conducted with lambing time as the dependent variable, which is a binary variable equal to 1 if the subject provides the winter lambing and 0 the spring lambing (Table 2). The impact of the frame on the subjects' decision making is significant. The results also indicated that gender had no significant effect on decision making behavior regarding lambing time. Like many developing counties, women's status is usually inferior to that of men in pastoral societies of northern China. Men generally play the role of decision maker, plan and administer livestock production. These male-dominated communities have important implications for how to effectively implement the ecological policies in pastoral regions.

### **Conclusion**

Our study has produced clear evidence of a significant framing effect. The results showed that participants of Han background were more inclined to choose to lamb in winter than those of Mongolian background. Multivariate analyses revealed that gender had no significant effects on pastoralist decision-making behavior.

### **References**

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