

Keywords . Milk payment, milk quality, sheep milk

Introduction. In the bovine milk sector the introduction of quality-based systems for differentiated payment of milk strongly increased milk and dairy products quality^{1,2}. In Tuscany (Italy) the sheep dairy sector is broadly developed and milk price fluctuations represent a critical point in the difficult relationships between farmers and cheese factories. Attempts in introducing a differentiated payment system are fragmentary and often unsuccessful, mainly because of the strong seasonal production variations and the lack of an effective sampling network^{3,4}. The object of the study was to define a quality-based system for differentiated payment of sheep milk in Tuscany.

Materials and Methods. Data set was obtained from 11 Tuscan cheese factories data bases. Fat and protein content values (%) of 19,782 samples collected from 2008 to 2011 in 812 sheep dairy farms were considered. The weighted average was computed for fat and protein on the litres of milk in the farm tank at the sampling time (SAS®).

For both parameters, one neutral class (0) and 4 awarding and 4 penalizing classes have been hypothesized with an increasing/decreasing of 0.3% for fat and 0.2% for protein from the weighted means (fat = 6.39%, protein=5.53%).

Results. The awarding and penalising classes are shown in table 1. The distribution of milk litres among the different classes are shown in graphics below, considering 3 milking seasons (december-march; april-july; august-november).



Table 1. Ranges of fat (%) and protein (%) contents for awarding and penalising classes

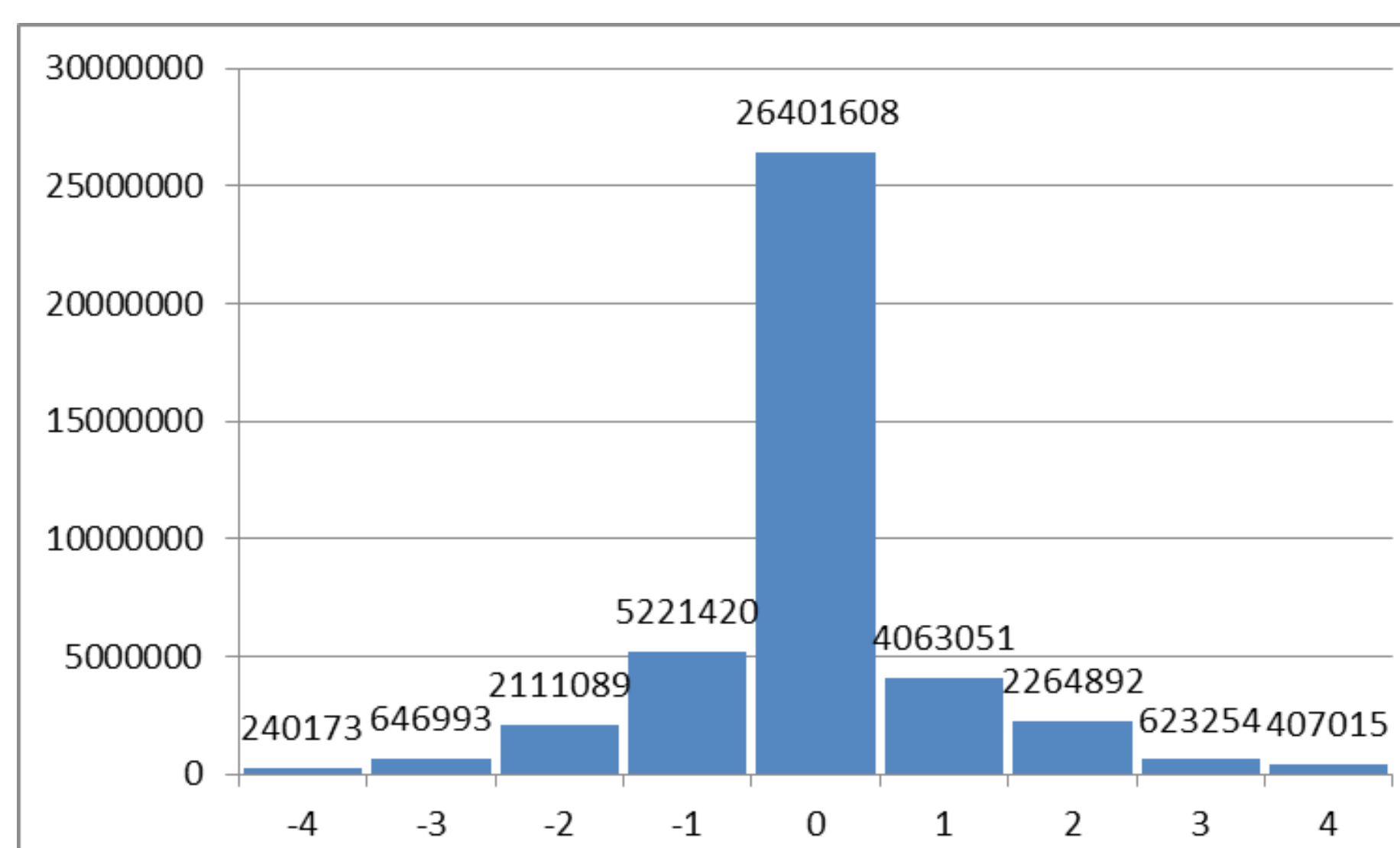
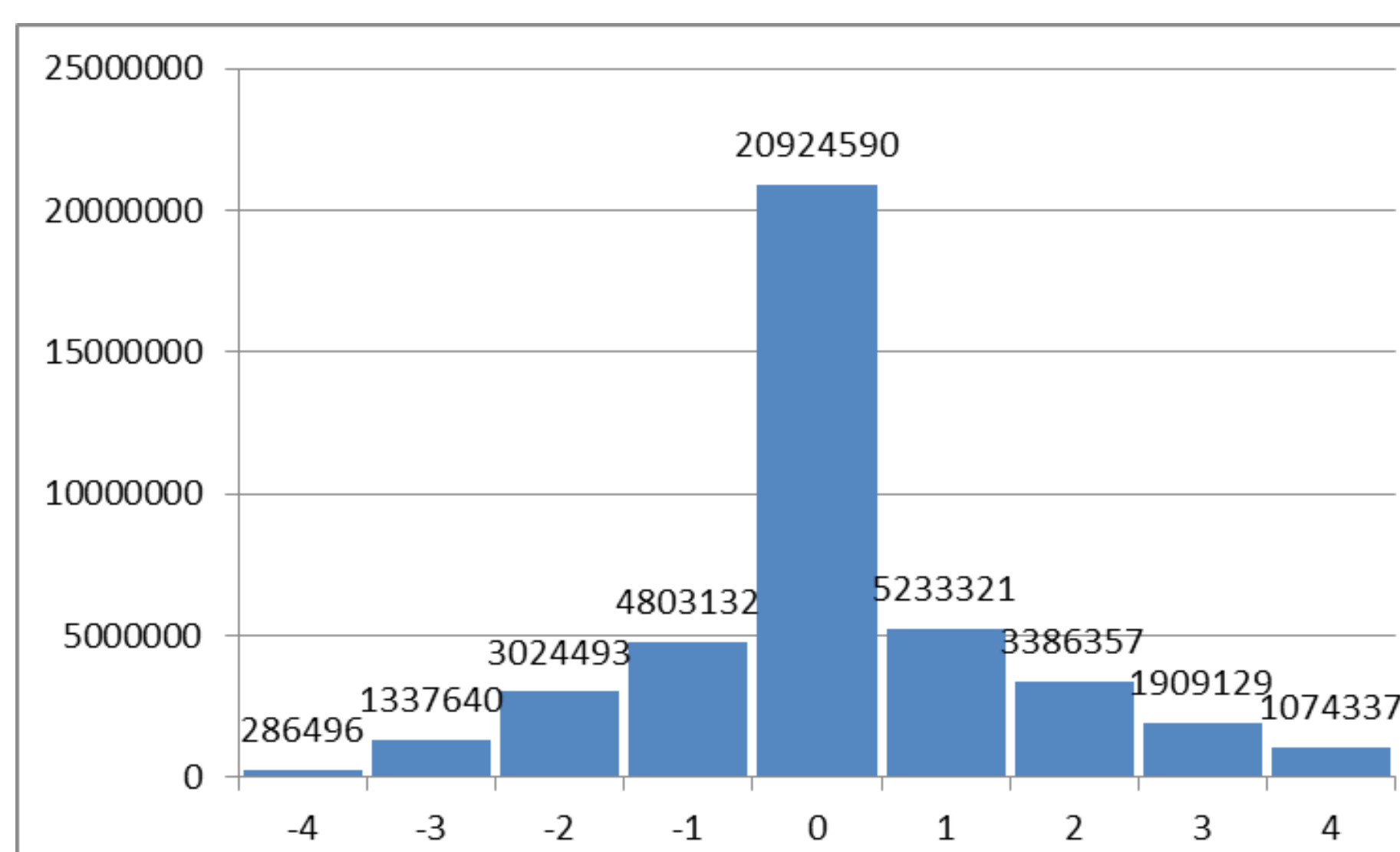
Class	-4	-3	-2	-1	0	1	2	3	4
Fat (%)	< 5.19	5.19	5.49	5.79	6.09	6.69	6.99	7.29	>7.59
		÷	÷	÷	÷	÷	÷	÷	
Protein (%)	< 4.73	4.73	4.93	5.13	5.33	5.73	5.93	6.13	>6.33
		÷	÷	÷	÷	÷	÷	÷	

Milk litres for each class (3 milking season)

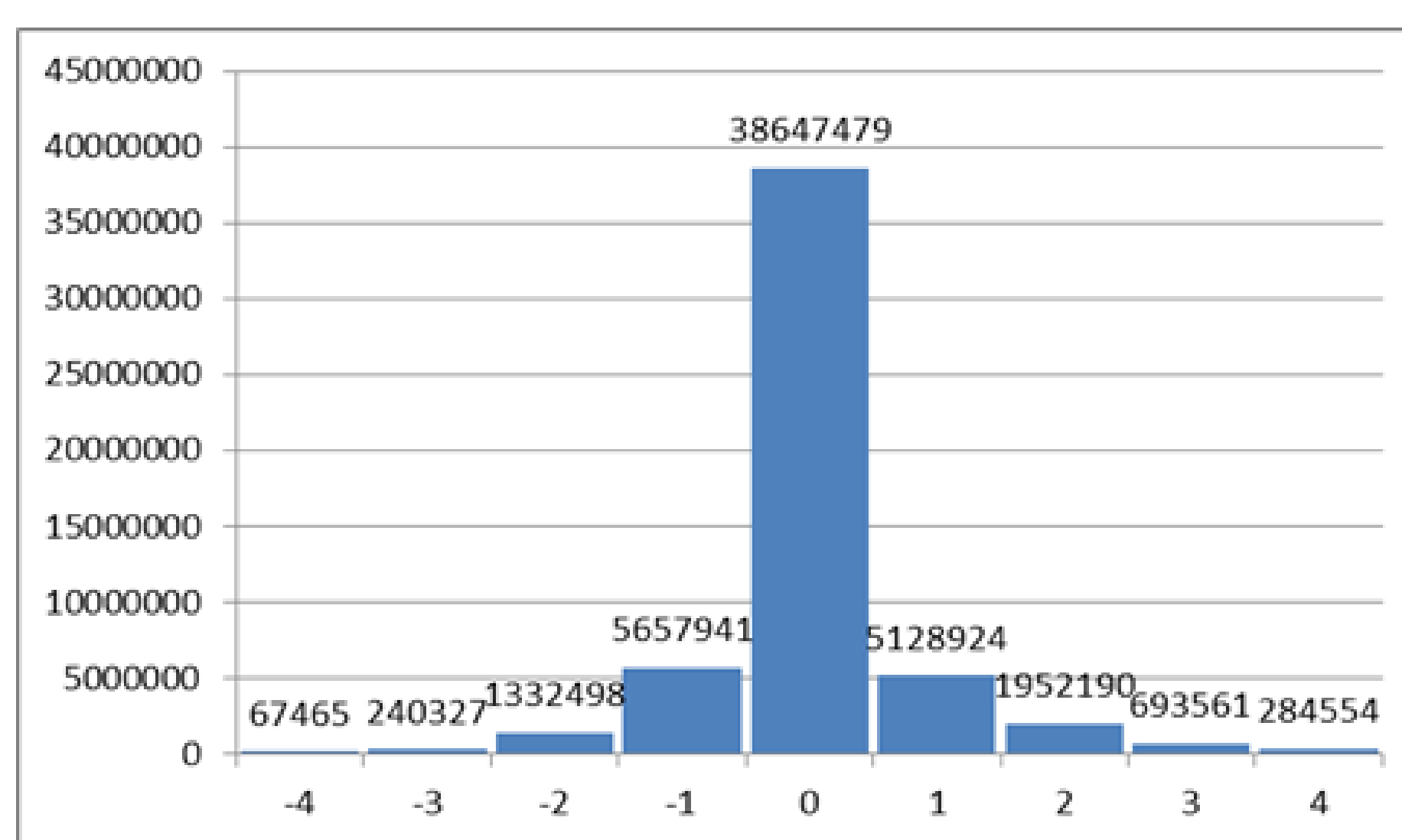
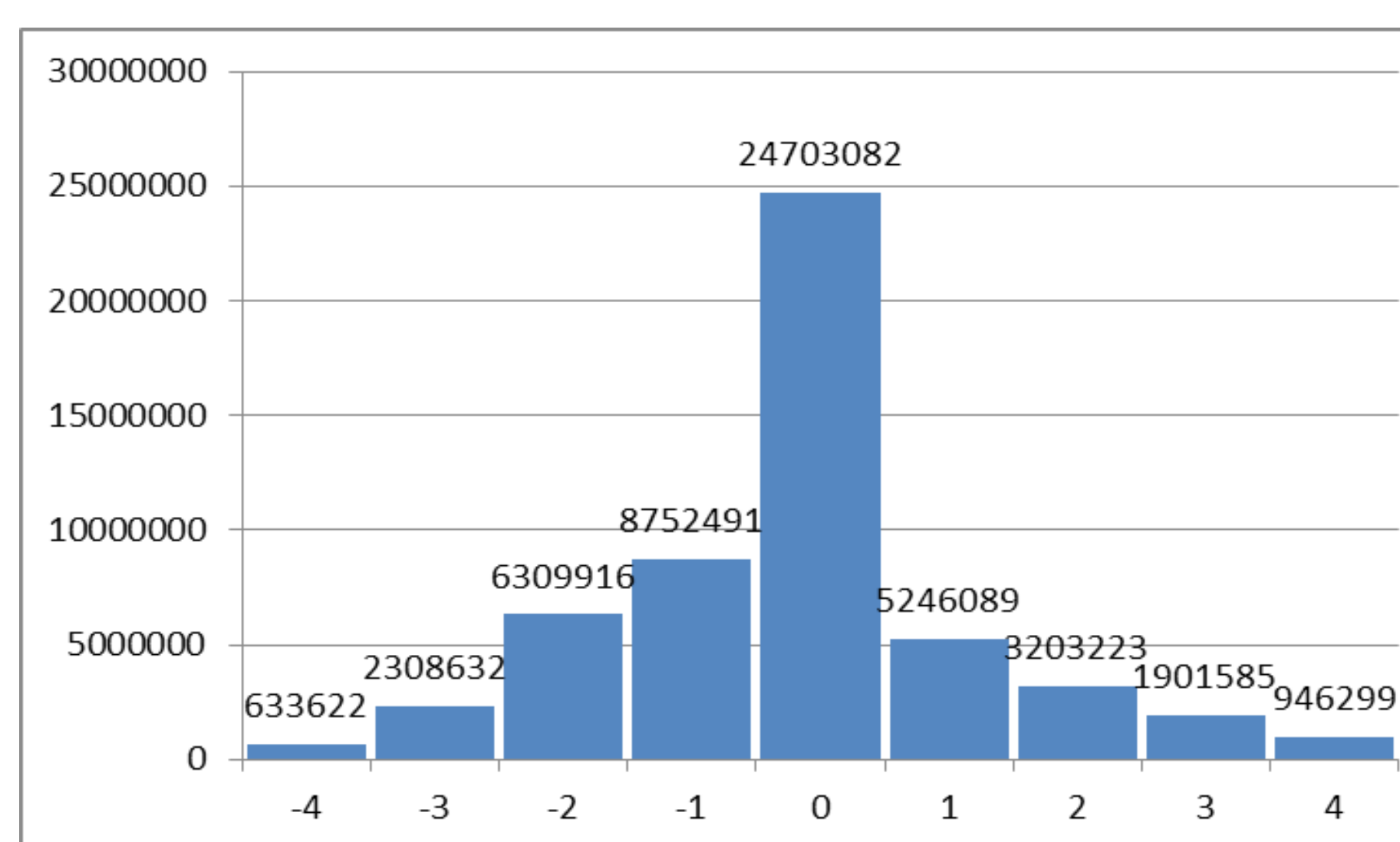
Fat

Protein

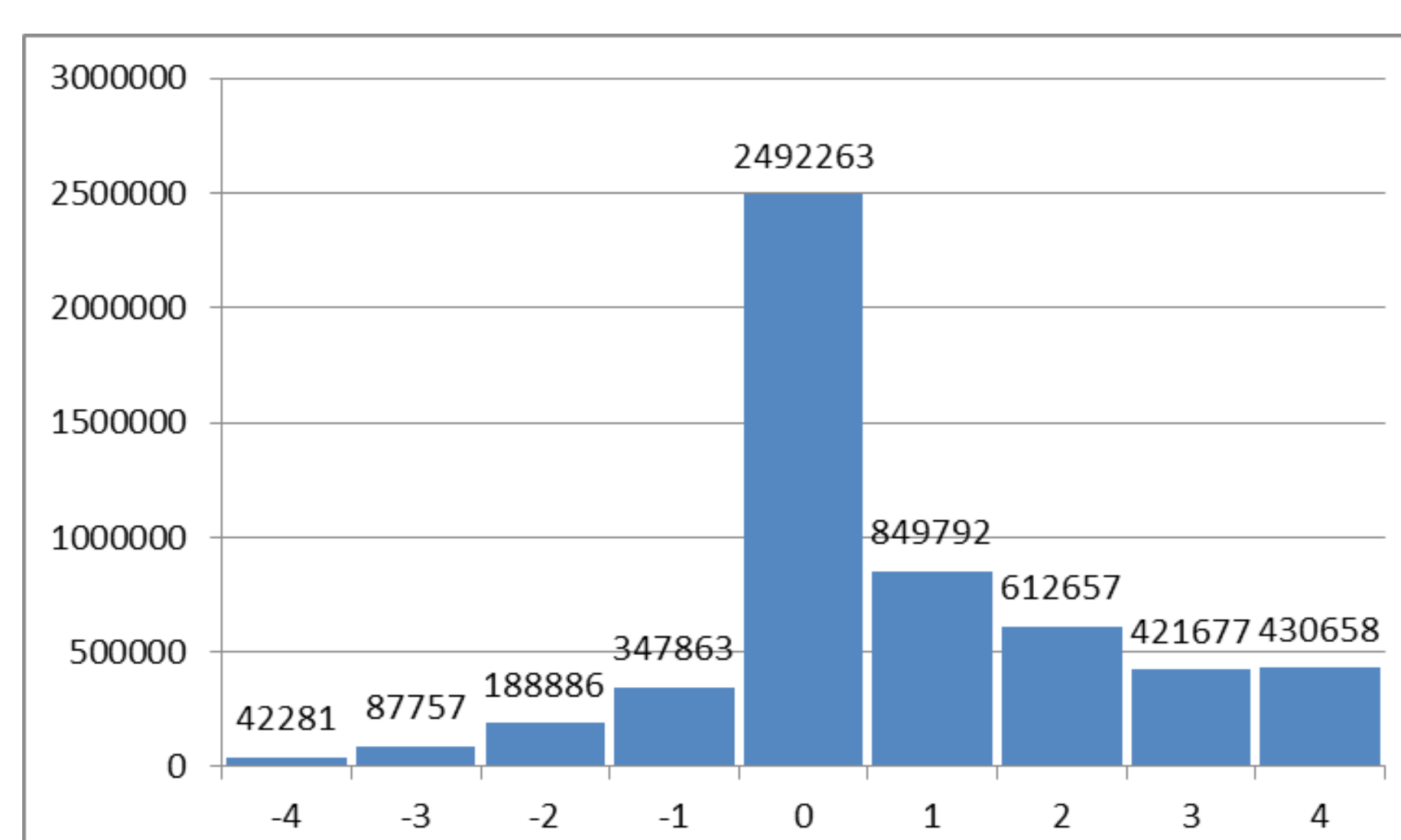
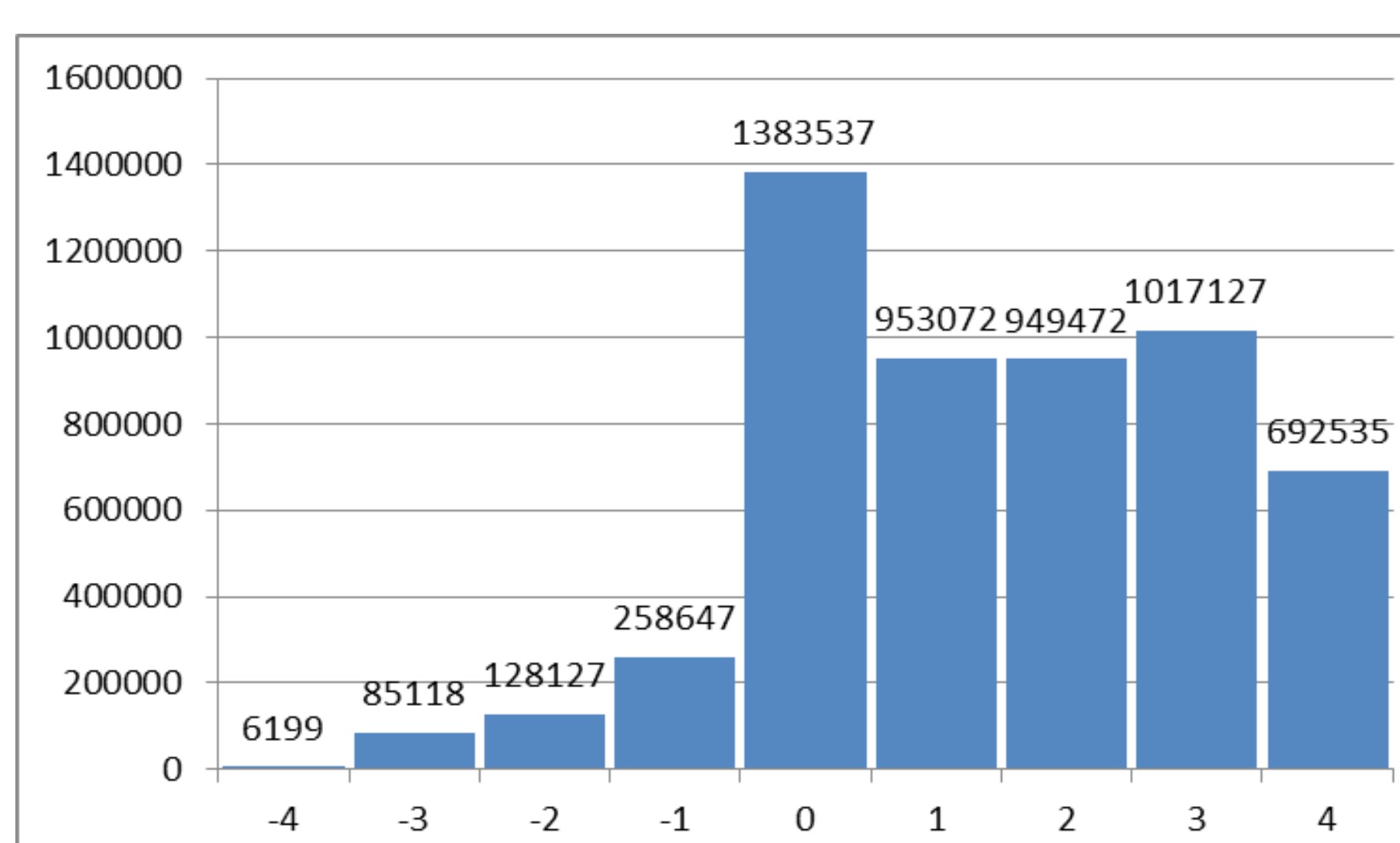
December-March



April-July



August-November



Discussion and conclusions. The adoption of a differentiated payment system seems to be an essential tool to improve milk quality. For decades, genetic selection of the ovine breeds tended to increase only milk quantity: in Tuscany, in the absence of a differentiated payment system, since 1999 the average values for fat (%) and proteins (%) of sheep milk remained almost unvaried, with mild worsenings⁴. In addition, the higher frequency of sampling, necessary for the differentiated payment implementation, could lead to a higher level of milk control. Nevertheless, the implementation of such a system may find some difficulties both in the complexity of the sampling network and in farmers' distrust. During the most productive period (from January to July), the designed system would gather the main part of the produced milk (about 50%) in the neutral class: this aspect, on one hand, would allow farmers to adapt themselves to the new system without sharp changes in milk price; on the other side, it may encourage strong and substantial improvements in farming techniques in order to reach the awarding classes. Furthermore, such a system would encourage to increase milk production in summer (deseasonalization), considering also the possibility of introducing new breeds (different from Sarda, the most raised in Tuscany), and new breeding techniques. Thus, a great amount of milk would be classified within awarding classes thanks to its higher fat content.

References

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