Economic and productive risk analysis in livestock systems

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Risk

Obtaining an economic result that is insufficient to cover an amount considered critical for the normal performance and evolution of the system and the sustainability of the producing agent.

Main sources of risk

- *Institutional*
- *Personal*
- *Financial*
- *Productive*
- *Markets*

Questions

- **Given changing price and yield scenarios, what are the probabilities that the system does not guarantee a sufficient operating result to cover these values?**
- **How often does it "fall" below them?**
- **What is the intensity of the loss on each occasion?**

Metodología

- **Two breeding systems**
  - Wooded wedge ("Cuña boscosa", Santa Fe province)
  - Saldado Basin ("Cuenca del Salado" Buenos Aires Province)
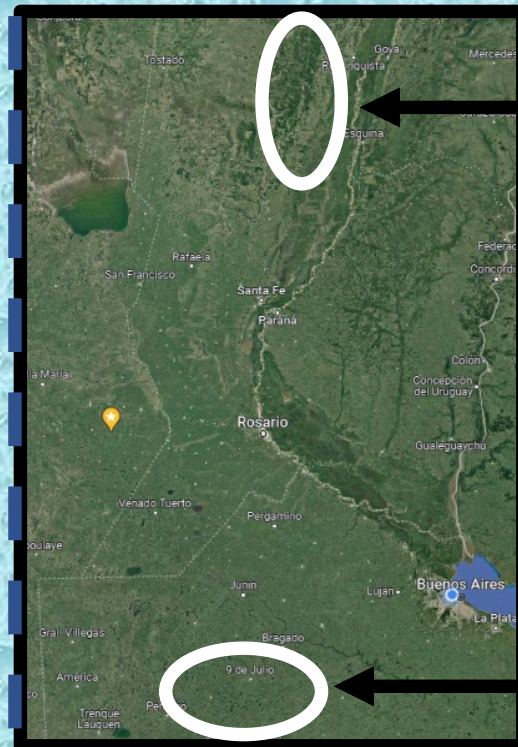
Wooded wedge (Cuña Boscosa)

Pehuajó – Salado Basin (Cuenca del Salado)

Values of some descriptive variables of both systems

Variable	Sistems	
	Cuña Boscosa	**Cuenca del Salado**
Fodder base	Extensive grazing of natural grasslands and forests	Natural grassland, multi-annual and verdant grasslands
Supplementation E-P	Occasional	Strategic
Workers	Temporary staff and producer	Permanent staff
Operated surface	730 ha	504 ha
Bellies	270 heads	389 heads
Burden	0,49 EV/ha	1,07 EV/ha
Invested capital	1.069.566 us$	1.929.717 us$

Determinant variables, probability distributions and parameters cons

Variable	Unidad	Tipo de distribución	Parámeters	
			Cuña boscosa	Cuenca del Salado
Waning	%	Triangular	51; 56; 60	73; 70; 65
Calf weight	kg/cab	Triangular	160; 170; 185	150; 160; 170
Cull cow weight	"	"	370; 380; 410	380; 400; 410
Fat cow weigh	"	"	Don´t have	440; 470; 490
Bull discard weight	"	"	600; 650; 680	600; 655; 675
Calf price (actual, march 2023)	u$s/kg	Truncated normal	2,30; 0,39; 1,95; 2,65	2,40; 0,37; 2,02; 2,70
Calf price (low, average 2019)	"	"	1,44; 0,30; 1,21; 1,72	1,50; 0,30; 1,78; 1,28

Crítical levels

- Financial: us$ 10,000: annual amount that satisfies family consumption

- Economic
  - Decapitalization: the system does not cover the depreciation of your capital assets
  - Remuneration for family work
  - Interest: return on invested/immobilized capital.
  - Land rent

- Real rate used: 3%

Risk indicators

- Frequency: Risk frequency index (RFI). Number of times that the operating result is less than the critical level.
  - Low
  - Half
  - high

- Magnitude of the loss (how much is lost each time it is lost). Risk Intensity Index (RII). Average drop in income with respect to the critical level considered.
  - Low
  - high

Risk indicators

		Risk frecuency indicator (RFI)		
		Low	Half	High
Risk intensity indicator (RII)	Low	Low risk	Half risk	Half / High risk
	High		Half / High risk	High risk

Results

	Cuña	Cuenca
Financial critical level family consumption	Risk free	Risk free
Critical economic levels		
Critical Level 1 (Decapitalization)	Risk free	Risk free
Critical Level 2 (Decapitalization + Family work)	Risk free	Risk free
Critical Level 3 (Decapitalization + Family work + Interest to K)	Risk free	Risk free
Critical Level 4 (Decapitalization + Family work + Interest on K + Land income)	High	High
Operating Result [us$/year]	28.284	44.101
Income [us$/year]	24.604	35.266
Cost effectiveness [%]	1,91	1,80

Results

Cría - Cuña Boscosa 730 ha - u$s 28.284 Resultado Operativo promedio

Descapitalización u$s 2.291
Trabajo Familiar u$s 7.156
Consumo Familiar u$s 10.000
Interés a los Capitales u$s 14.854
Renta Fundiaria u$s 38.944
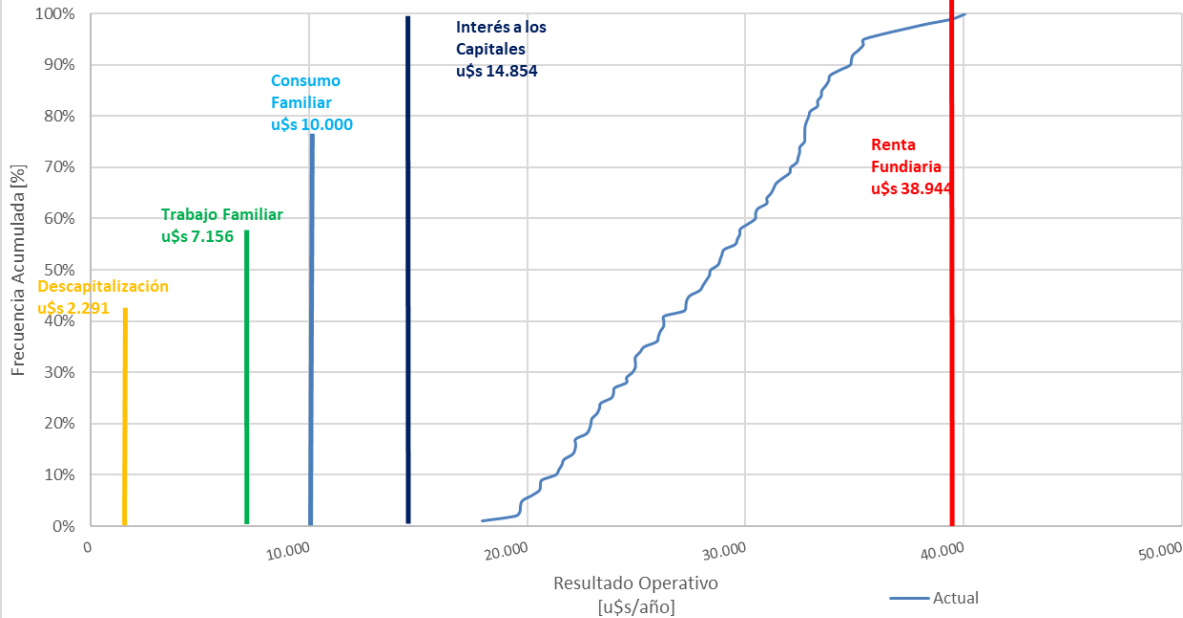
Cría - Cuenca del Salado 504 ha - u$s 44.101 Resultado Operativo promedio

Descapitalización u$s 7.704
Trabajo Familiar u$s 8.167
Consumo Familiar u$s 10.000
Interés a los Capitales u$s 21.693
Renta Fundiaria u$s 65.541
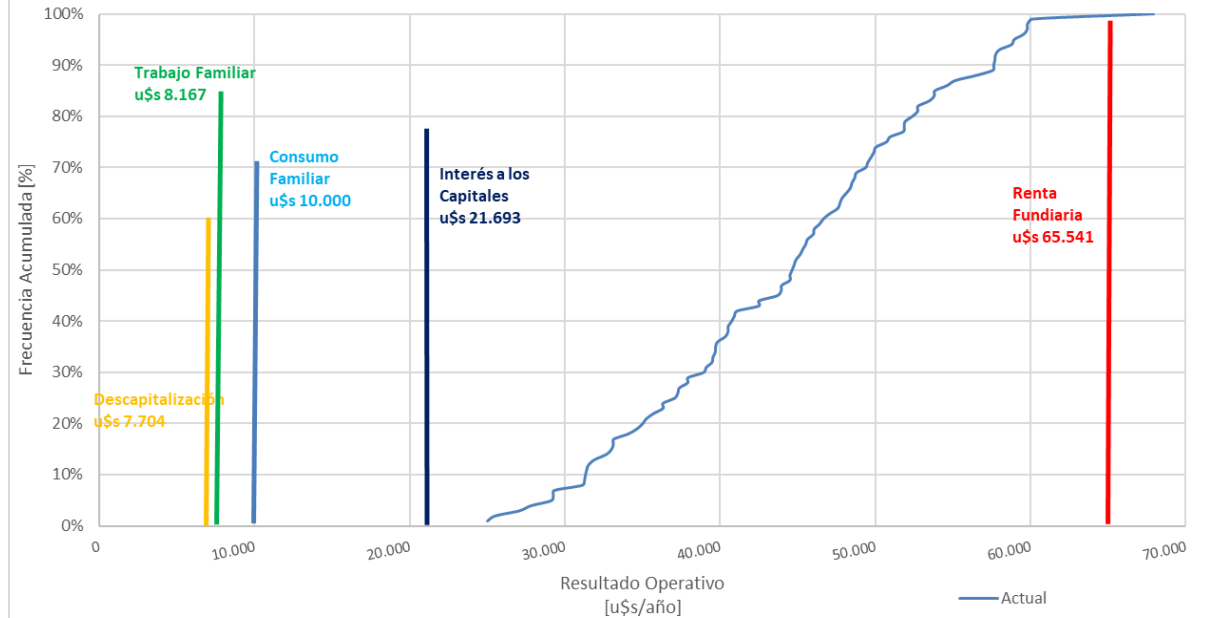
Results at prices for the year 2019

	Average	Standard desviation	Max	Min
Cuña Boscosa	1,44	0,31	1,72	1,21
Cuenca del Salado	1,50	0,30	1,78	1,28

	Cuña	Cuenca
Financial critical level family consumption	High	High
Critical economic levels		
Critical Level 1 (Decapitalization)	High	High
Critical Level 2 (Decapitalization + Family work)	High	High
Critical Level 3 (Decapitalization + Family work + Interest to K)	High	High
Critical Level 4 (Decapitalization + Family work + Interest on K + Land income)	High	High
Operating Result [us$/year]	7.470	3.703
Income [us$/year]	5.649	1.835
Cost effectiveness [%]	0,14	- 0,12

Results at prices for the year 2019

Cría - Cuña Boscosa 730 ha - u$s 28.284 y 7.470 Resultado Operativo promedio

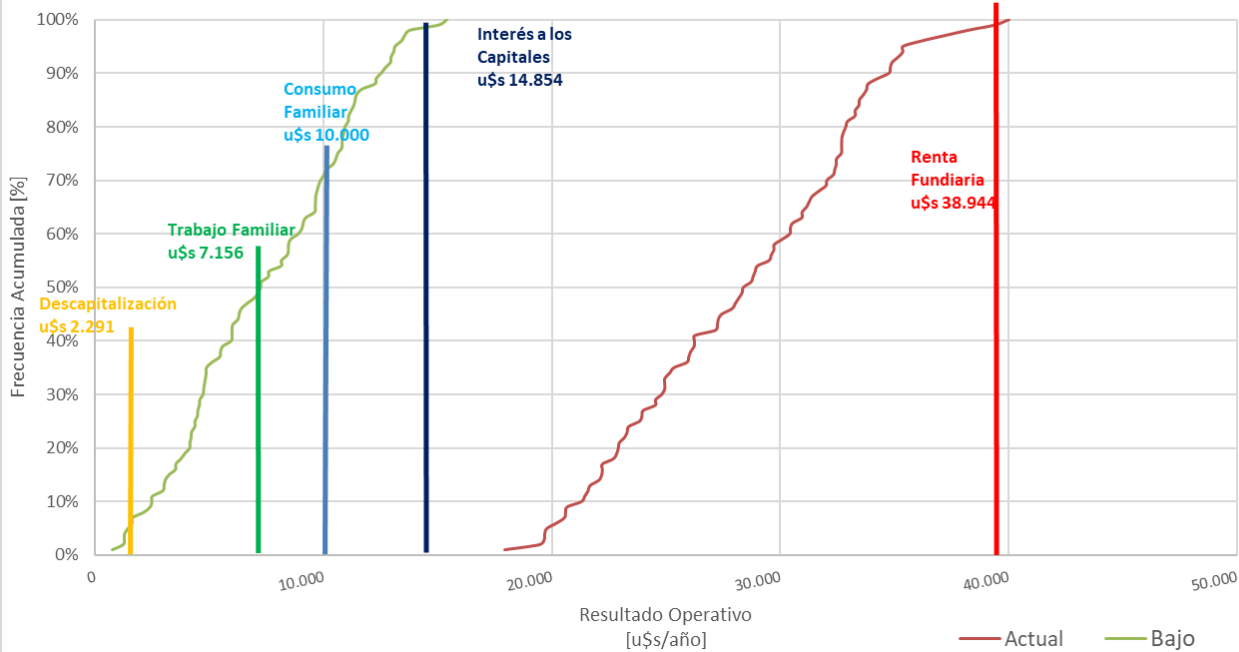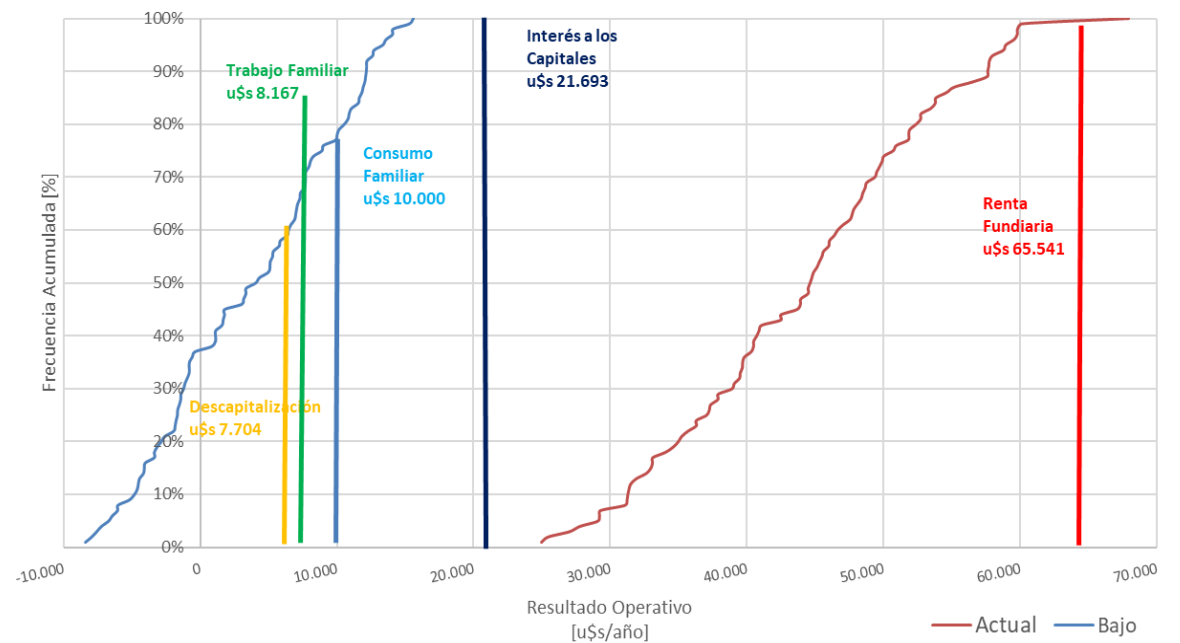**Cría - Cuenca del Salado** 504 ha - u$s 44.101 y 3.703 Resultado Operativo promedio

Conclusions

- **Low financial critical level (according to Total Basic Basket).**

- **Low level of decapitalization.**

- **High risk of covering (not covering) the payment to all factors.**

- **At 2019 prices, high risk for all critical levels considered.**

Values of the resulting risk indicators and risk typology defined for the critical level "Decapitalization" in the Cuña Boscosa system and for the critical level "Family consumption" in the Cuenca del Salado system.

	Cuenca del Salado	Cuña Boscosa
Critical level	Family consumption	Descapitalization
Frecuency rate	77%	12%
Intensity index	89%	40%
Typology	High risk	Medium risk

Discusión

- The analysis indicates the importance of internal management, the technology applied, the average costs with which the systems operate, among other elements.

- The volatility of the markets for agricultural products makes it possible to obtain large profits and expose the company to potential losses the following season, which expose it to situations of bankruptcy.

- There are price hedging tools for grain markets, but not for livestock,

- Need to generate self-insurance or other countercyclical instruments but, mainly, put strategy in production and marketing technologies

- What is the price of the calf from which it is no longer convenient to supplement the ranch?

- What is the cost of incorporating practices that allow us to substantially increase the weaning percentage?

- Are there company sizes for which there are no risks?

Thanks for your attention !!!
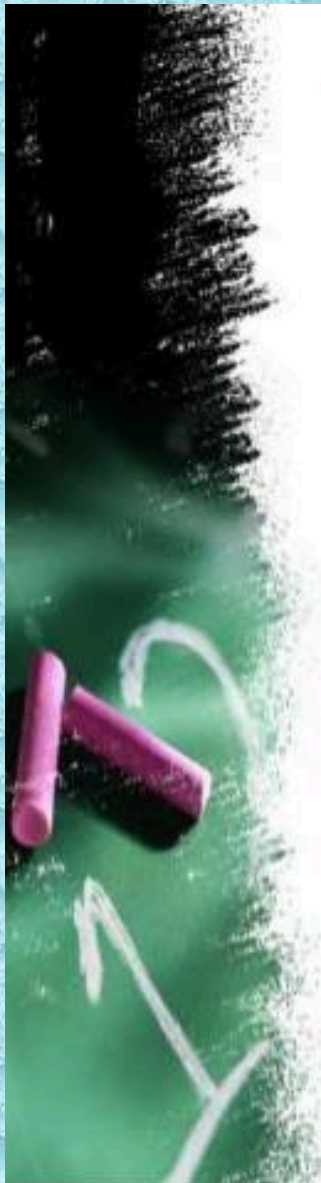
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