Reducción de grasa y sal en productos cárnicos mediante la adición de harinas de hongos comestibles

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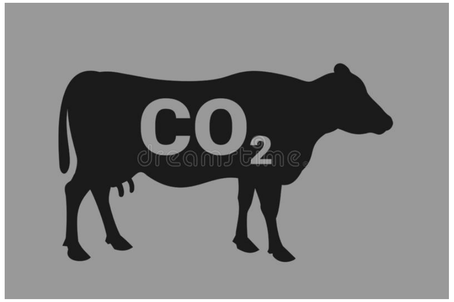
Eva María Santos López

FORO - AMEXITEC 2021

Nutritivo/Status

+SALUD



Plant-based foods

Plantas infrautilizadas
Subproductos
Coproductos

Verduras

Frutas

Cereales y oleaginosas

Leguminosas

+14000 especies
+3000 alimento/medicinales
+35 especies aprovechadas

Lentinula edodes
(Shiitake)

Flammulina velutipes

Pleurotus ostreatus

Agaricus brunescens
(Portobello)

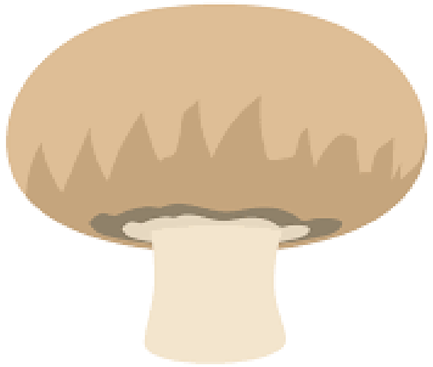
Tremella fuciformis

Agaricus bisporus

Volvariella volvacea

Hidratos de carbono
35-80%

Proteína
15-35%



Fibra dietética
10-40%

Lípidos
< 8%

Vitaminas
35-70%

Minerales
6-11%

Umami

(Das et al., 2021)

(Perez-Montes et al., 2021)

Preparación de la harina

Agaricus bisporus

Selección, lavado y corte

Escaldado
Ácido acético 2%
80°C/5 min

Pleurotus ostreatus

Selección, lavado y corte

Secado
(60°C/24 h)

Molido y tamizado

Agaricus bisporus Ab

Pleurotus ostreatus Po

Composición

Parámetro (%)	Harina	
	Ab	Po
Humedad	5.85 ± 0.25[a]	7.48± 0.37[b]
Proteína (N x 4.38)	28.63± 0.10 [b]	16.04± 0.22 [a]
Grasa	2.10 ± 0.09[a]	3.10 ± 0.13 [b]
Ceniza	8.14 ± 0.27 [b]	7.12± 0.22 [a]
Carbohidratos	61.12 ± 0.20 [a]	73.73 ± 0.41 [b]
Fibra dietética total	22.82± 0.42 [a]	43.58± 1.33 [b]
Fibra dietética insoluble	20.51± 0.10 [a]	40.69± 0.18 [b]
Fibra dietética soluble	1.67± 0.18 [a]	4.19 ± 0.28[b]

Color

	Harina	
	Ab	Po
L^*	61.38[a]	69.24[b]
a^*	6.35[a]	8.05[b]
b^*	23.10[a]	29.03[b]
a_w	0.307[a]	0.346[b]

Formulaciones

C (10 % grasa y 1.2 %, NaCl)

C (25 % grasa y 1.5 %, NaCl)

C (30 % grasa, 2.0% NaCl)

Medium FAT

25-30% grasa 50 % NaCl

MF-Ab
MF-Po 2.5%

Low FAT

50 % grasa 50 % NaCl

LF-Ab
LF-Po 5.0 %

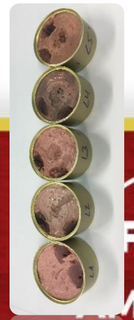
LF-Ab50
LF-Po50 7.5%

LF-Ab70
LF-Po70 10%

Composición

g/100 g	C	CMF	MF-Ab	MF-Po	CLF	LF-Ab	LF-Po
Humedad	68.78^{a}	72.20^{d}	71.76^{cd}	70.99^{bcd}	74.48^{e}	69.99^{ab}	70.58^{bc}
Grasa	10.86^{d}	7.65^{c}	6.99^{bc}	6.83^{bc}	4.68^{a}	6.09^{abc}	5.59^{ab}
Proteína	17.53^{ab}	17.37^{a}	18.69^{bc}	18.78^{bc}	18.51^{abc}	19.23^{c}	18.80^{bc}
Ceniza	1.90^{d}	1.88^{d}	1.51^{a}	1.49^{a}	1.94^{d}	1.59^{b}	1.69^{c}
CHOs	0.93^{ab}	0.89^{ab}	1.05^{ab}	1.91^{b}	0.39^{a}	3.09^{c}	3.34^{c}
Na (mg/100g)	420.16^{c}	426.60^{c}	269.89^{b}	215.56^{a}	458.74^{d}	233.58^{a}	237.30^{a}

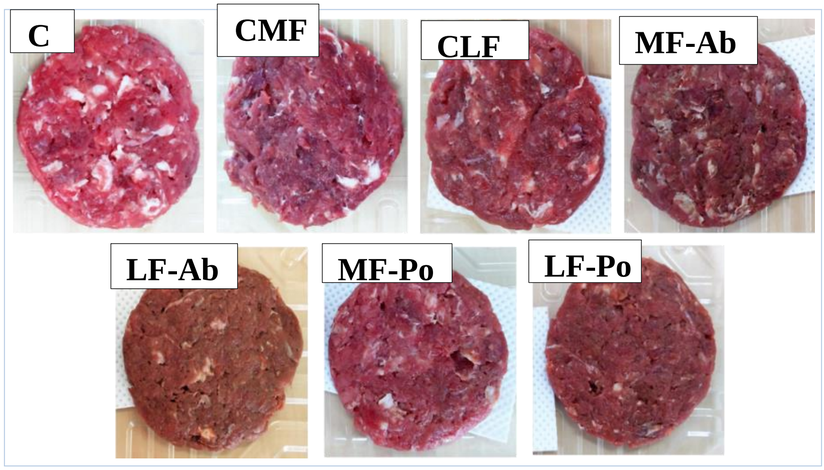
	C	MF-Ab	MF-Po	LF-Ab	LF-Po	MF-PoAb
Humedad	61.05^{a}	64.34^{b}	65.91^{d}	66.34^{de}	66.48^{e}	65.37^{c}
Grasa	19.16^{f}	16.28^{e}	15.18^{d}	12.99^{b}	11.79^{a}	14.04^{c}
Proteína	14.39^{b}	14.70^{b}	13.62^{a}	15.41^{c}	14.59^{b}	14.29^{b}
Cenizas	2.08^{d}	1.30^{a}	1.36^{ab}	1.36^{ab}	1.81^{c}	1.41^{b}
CHOs	3.32^{a}	3.37^{a}	3.93^{b}	3.90^{b}	5.33^{d}	4.88^{c}
Fibra diet	0.05^{a}	0.57^{b}	1.09^{c}	1.14^{c}	2.18^{e}	1.58^{d}
Na (mg/100g)	686.30^{c}	338.69^{a}	336.46^{a}	345.22^{a}	405.19^{b}	347.48^{a}
pH	5.94^{a}	6.11^{c}	6.10^{c}	6.04^{b}	6.04^{b}	6.10^{c}

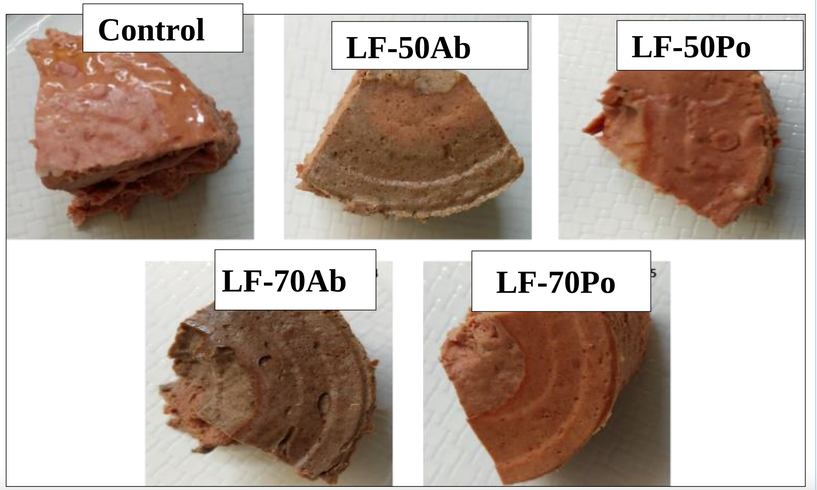


	C	Ab50	Po50	Ab70	Po70
Humedad	56.52^{a}	62.44^{d}	61.42^{c}	59.41^{b}	59.36^{b}
Grasa	24.48^{c}	13.04^{a}	13.64^{ab}	14.18^{b}	13.81^{b}
Proteína	13.82^{a}	16.39^{d}	14.52^{b}	17.76^{e}	15.79^{c}
Ceniza	3.46^{e}	2.14^{a}	2.46^{b}	2.64^{c}	2.81^{d}
Carbohidratos	1.97^{a}	6.00^{b}	7.96^{c}	6.02^{b}	8.22^{c}
Fibra dietética	nd	1.73^{a}	3.31^{c}	2.43^{b}	4.63^{d}
Na (mg/100g)	992.36^{d}	642.16^{c}	592.16^{b}	583.16^{ab}	555.55^{a}
pH	5.98^{a}	6.04^{c}	6.01^{b}	6.07^{d}	6.02^{b}
a_w	0.972^{a}	0.986^{d}	0.981^{c}	0.977^{b}	0.977^{b}

↑ Humedad
Proteína
Fibra dietetica

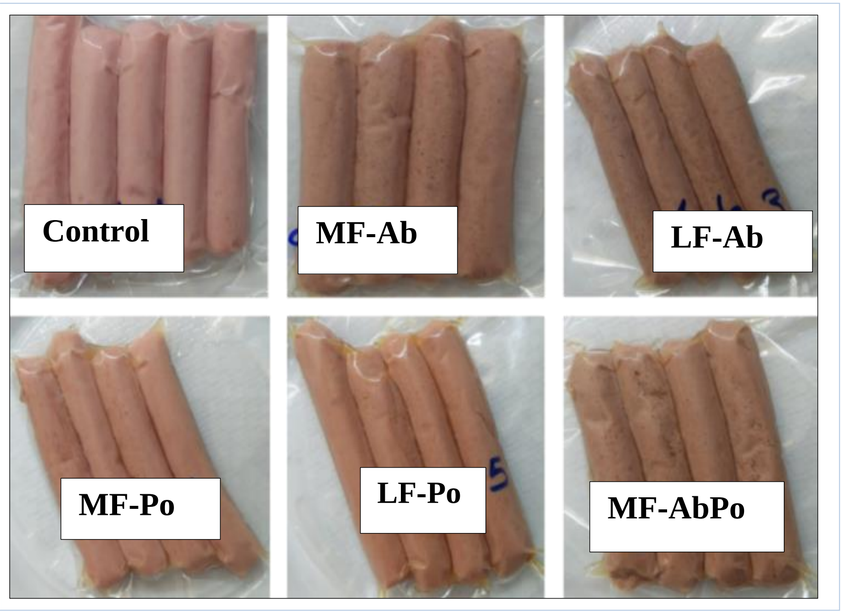
Color



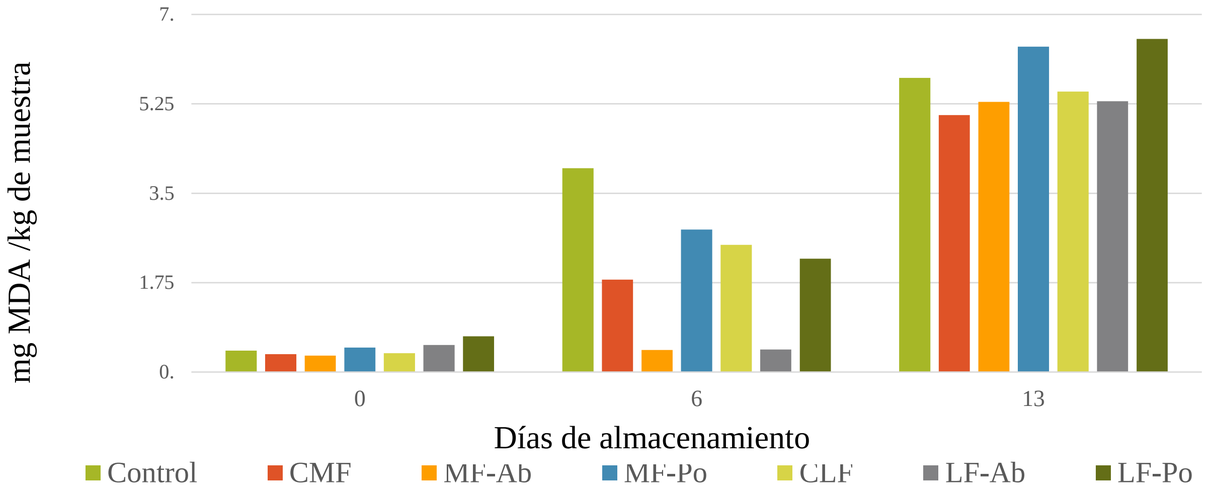


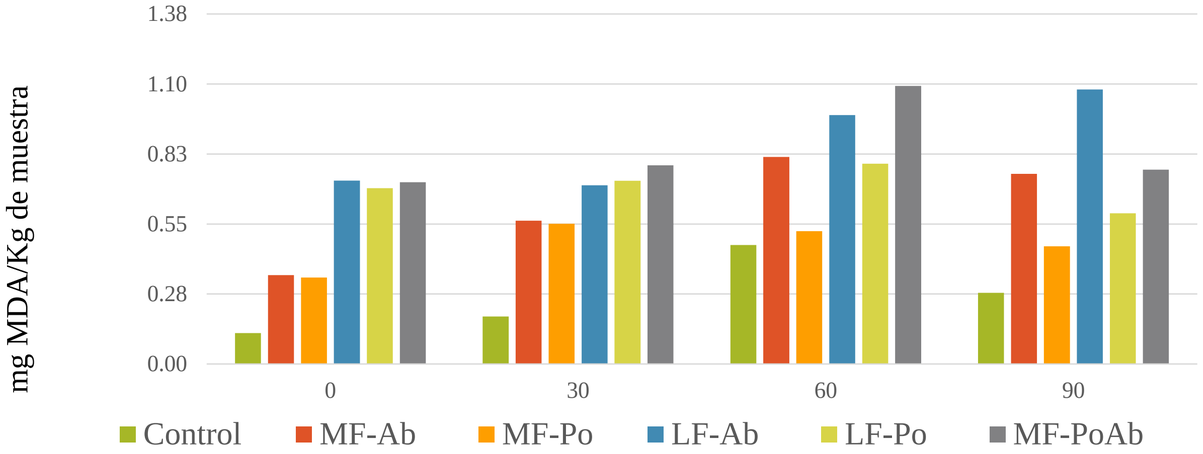
Harina Ab

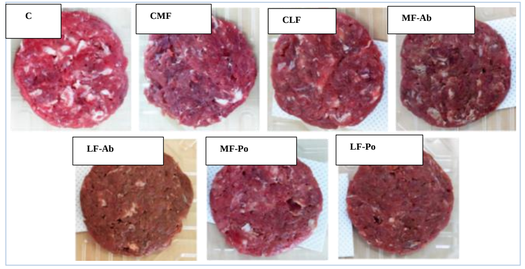
Harina Po

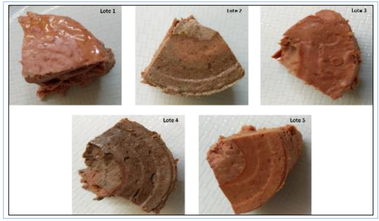


Estabilidad lipídica (TBARS)

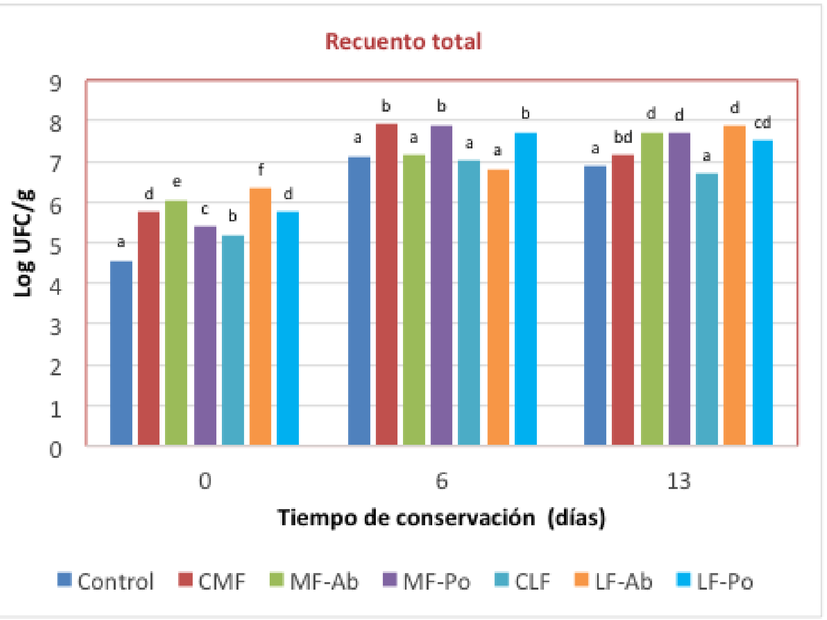


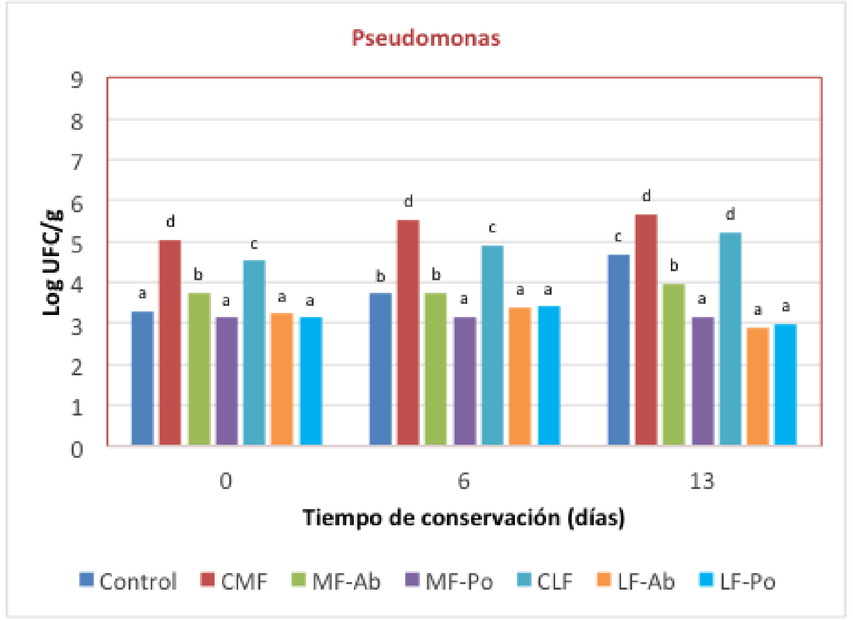


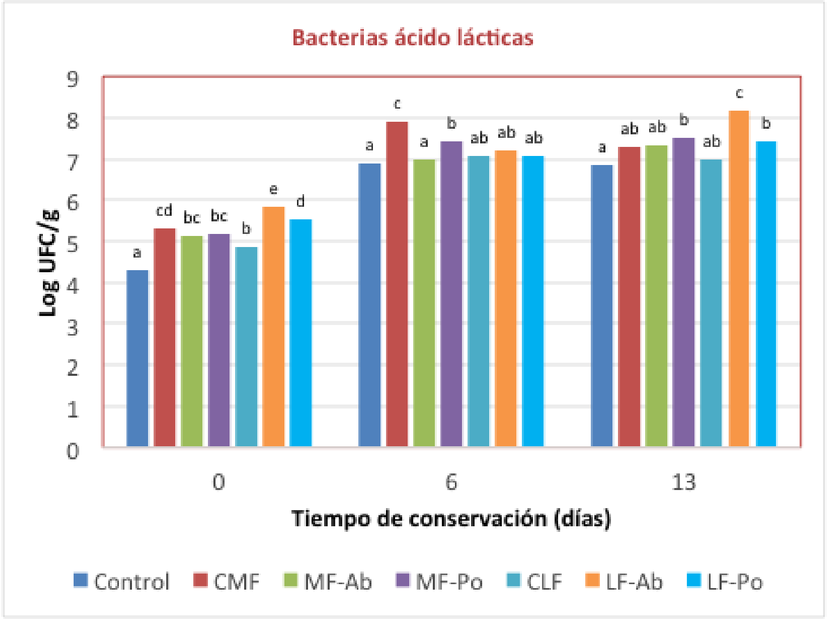


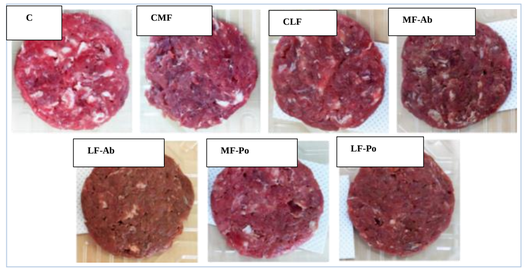


Resultados microbiológicos

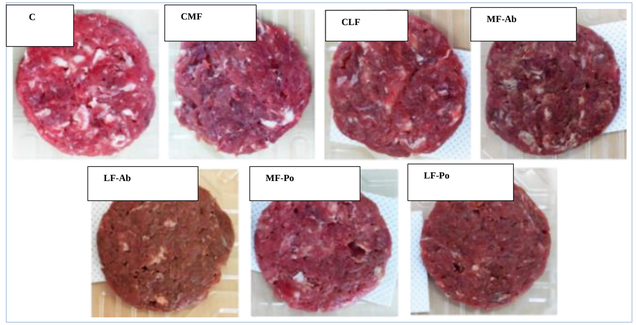


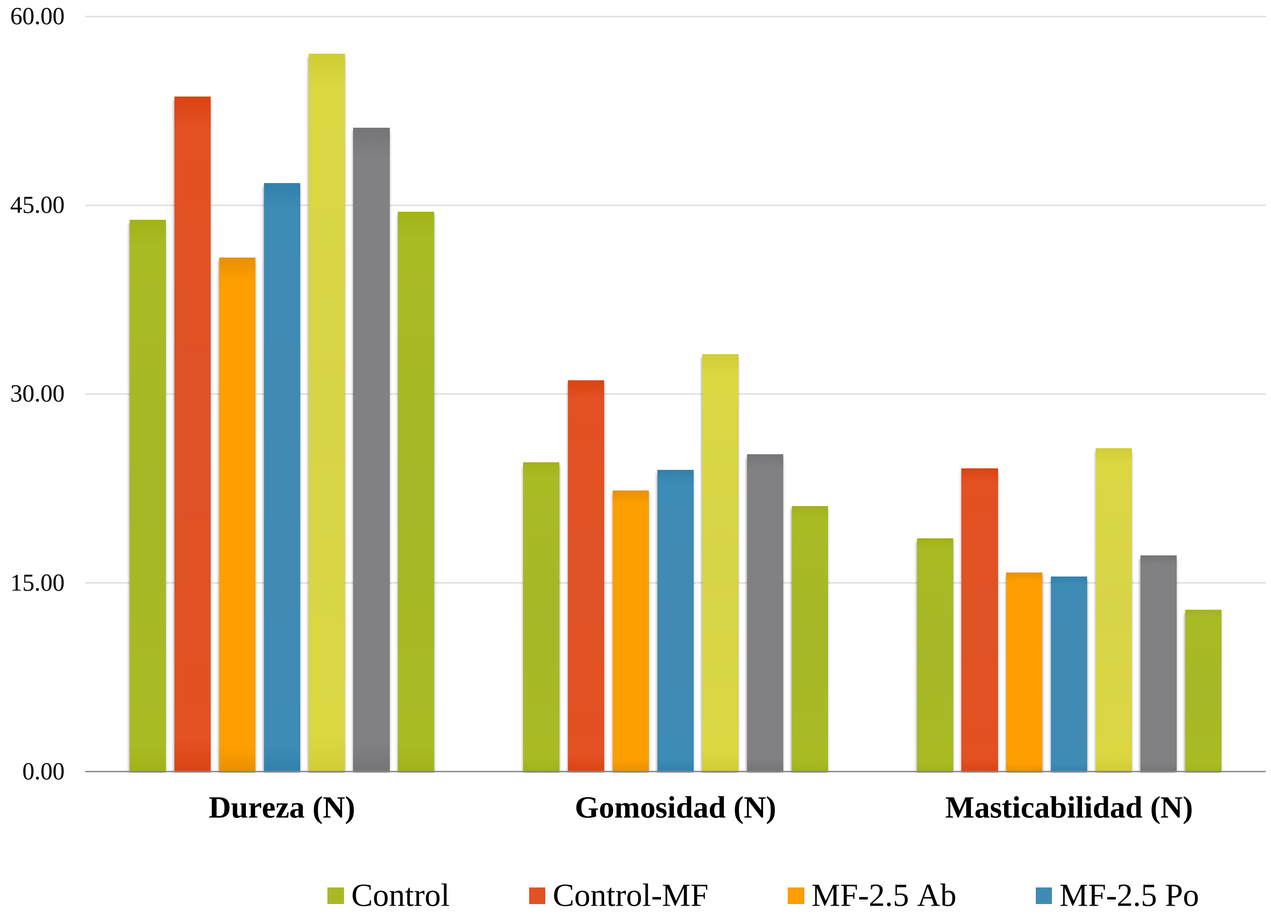


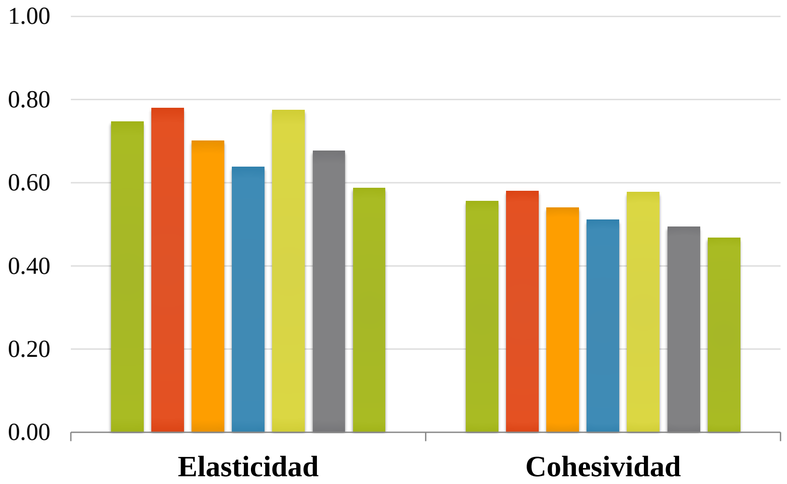




Textura

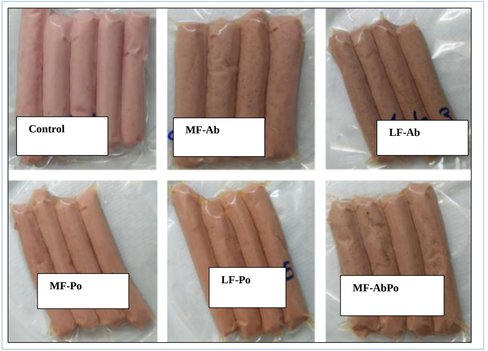


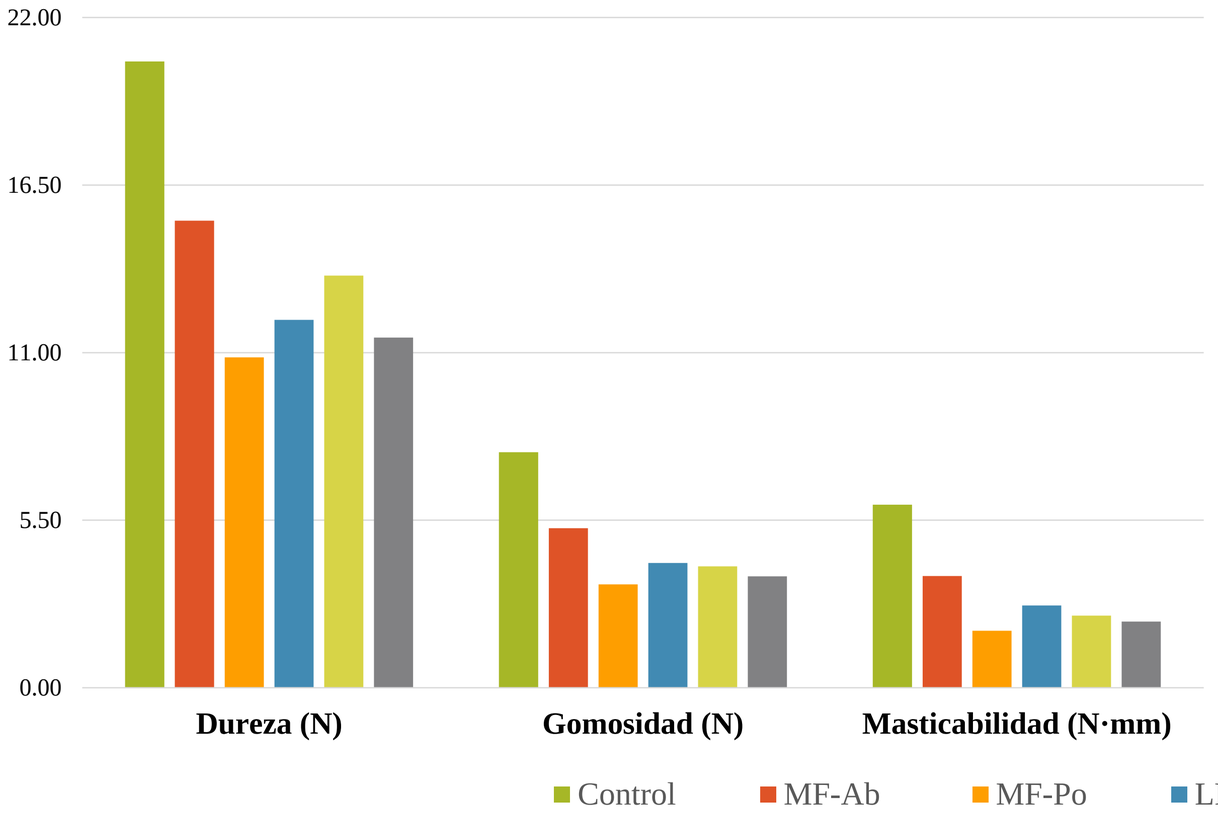


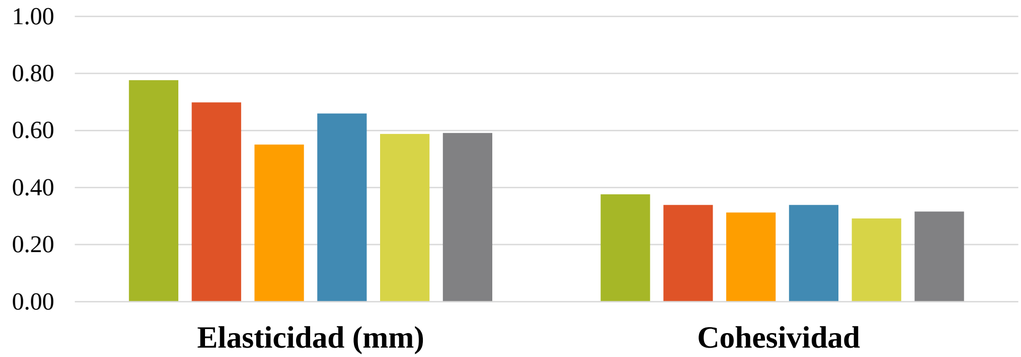


Control Control-MF MF-2.5 Ab MF-2.5 Po Control-LF LF-5.0 Ab LF-5.0 Po

Textura

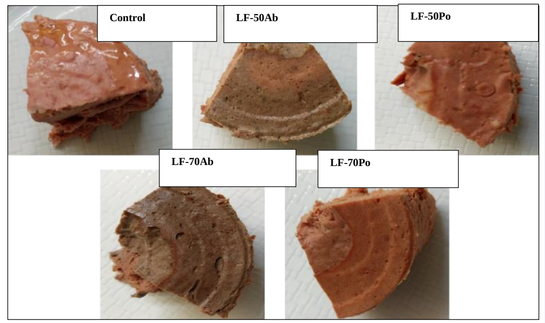


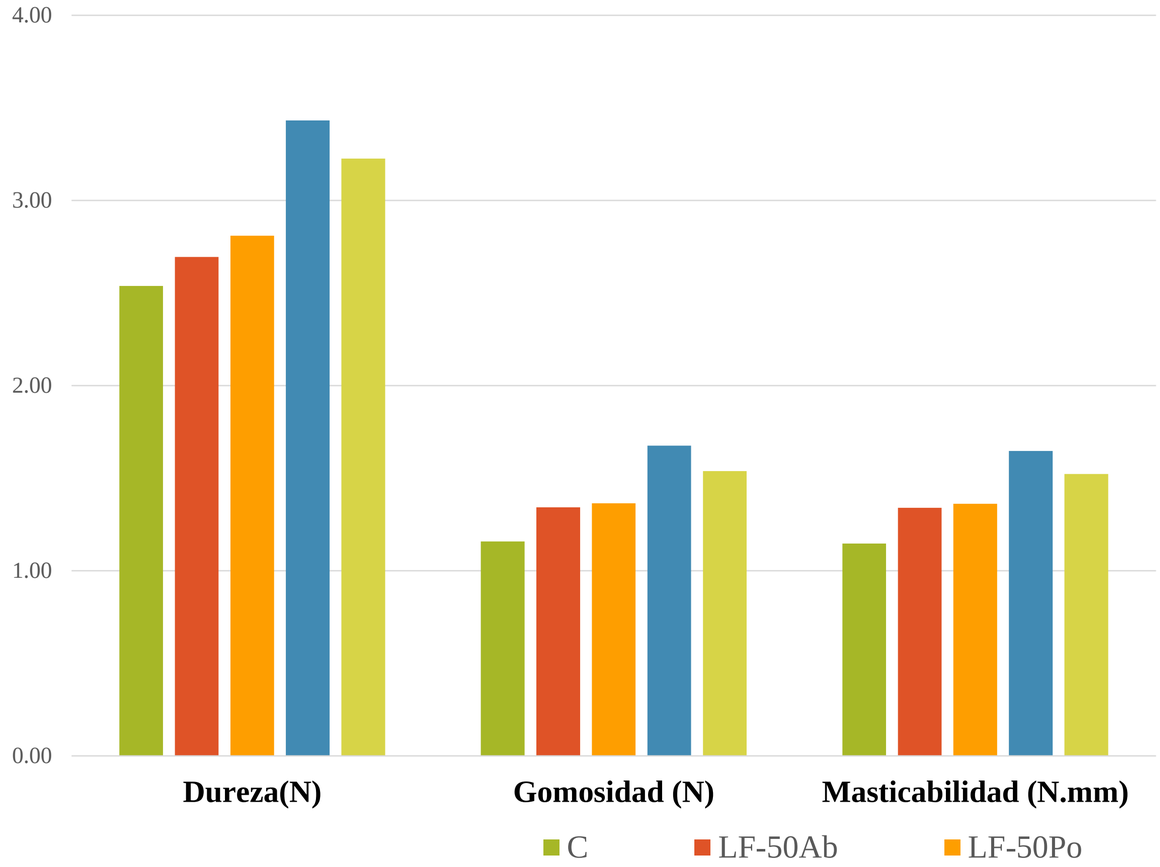


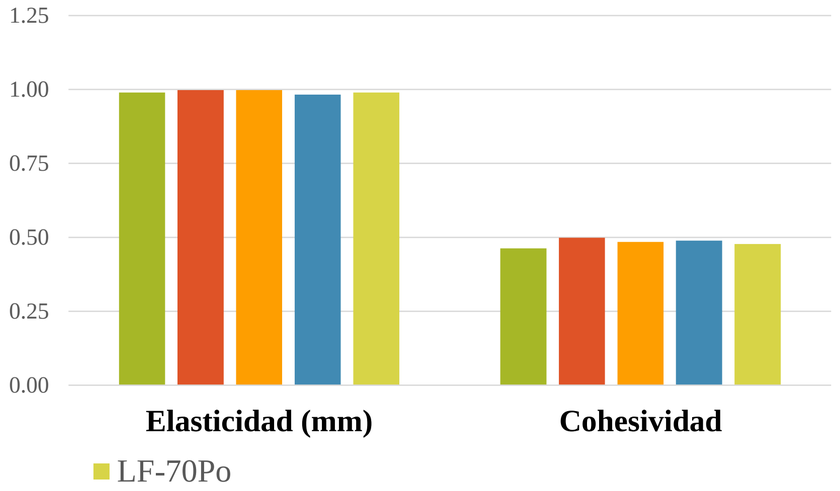


Control MF-Ab MF-Po LF-Ab LF-Po MF-PoAb

Textura

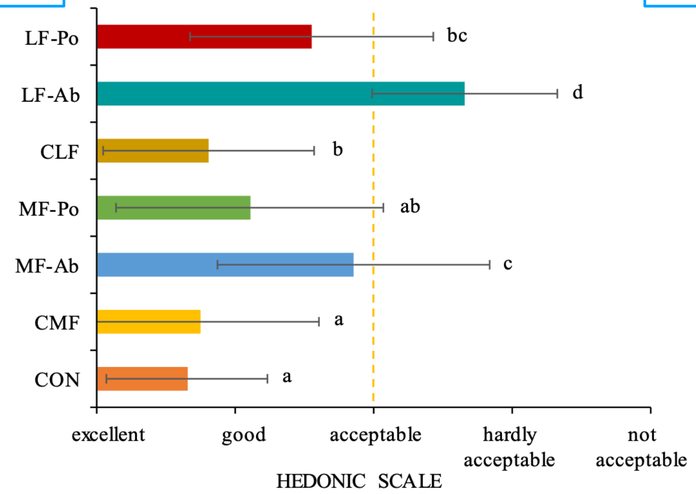

Control
LF-50Ab
LF-50Po
LF-70Ab
LF-70Po


4.00
3.00
2.00
1.00
0.00
Dureza(N)
Gomosidad (N)
Masticabilidad (N.mm)
C
LF-50Ab
LF-50Po
LF-70Ab
LF-70Po

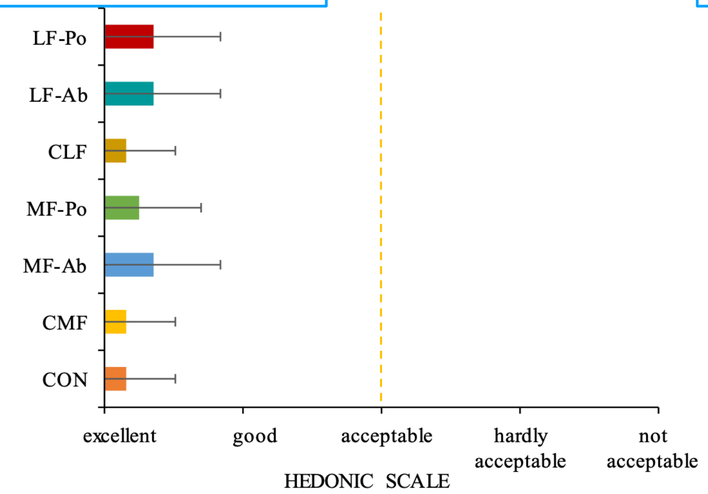

1.25
1.00
0.75
0.50
0.25
0.00
Elasticidad (mm)
Cohesividad

Sensorial

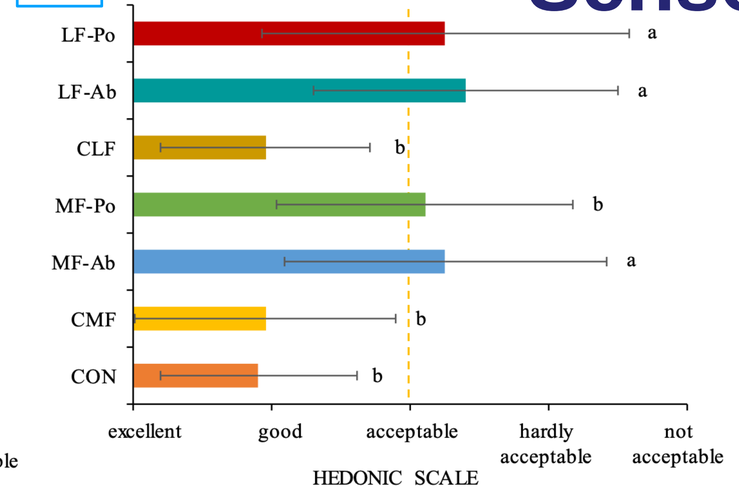
Color



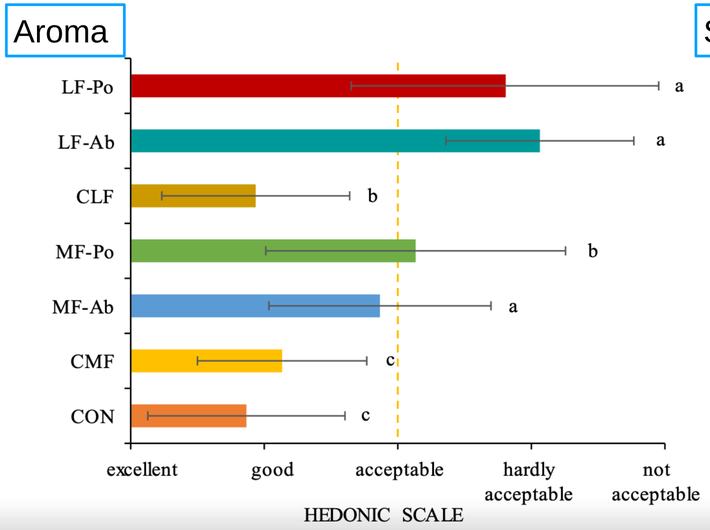
Decoloración superficial



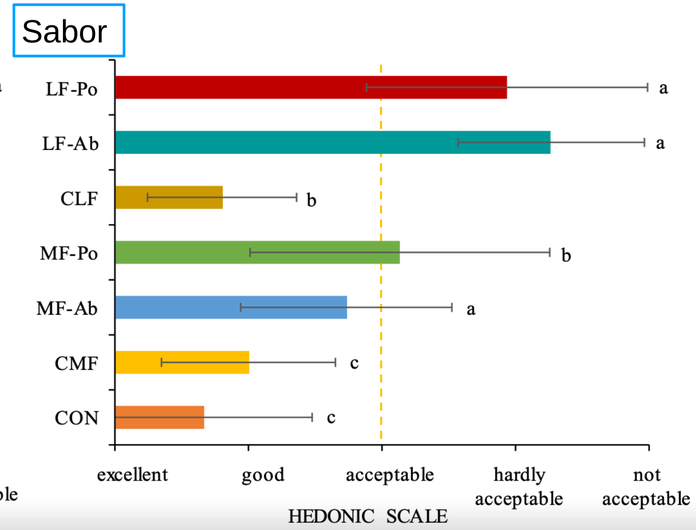
Olor

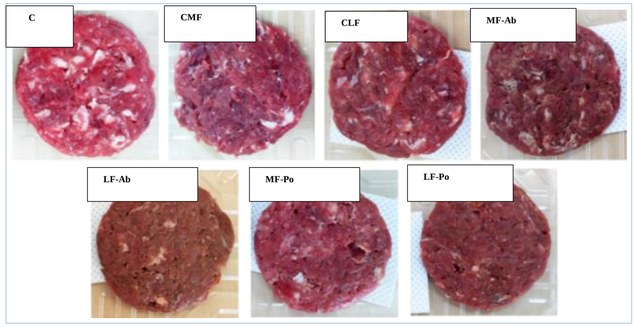


Aroma

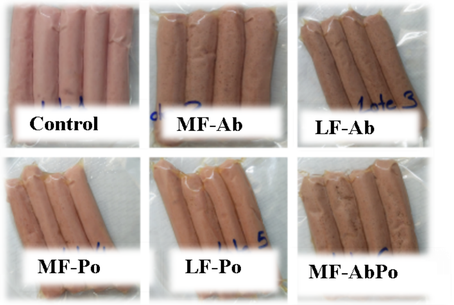


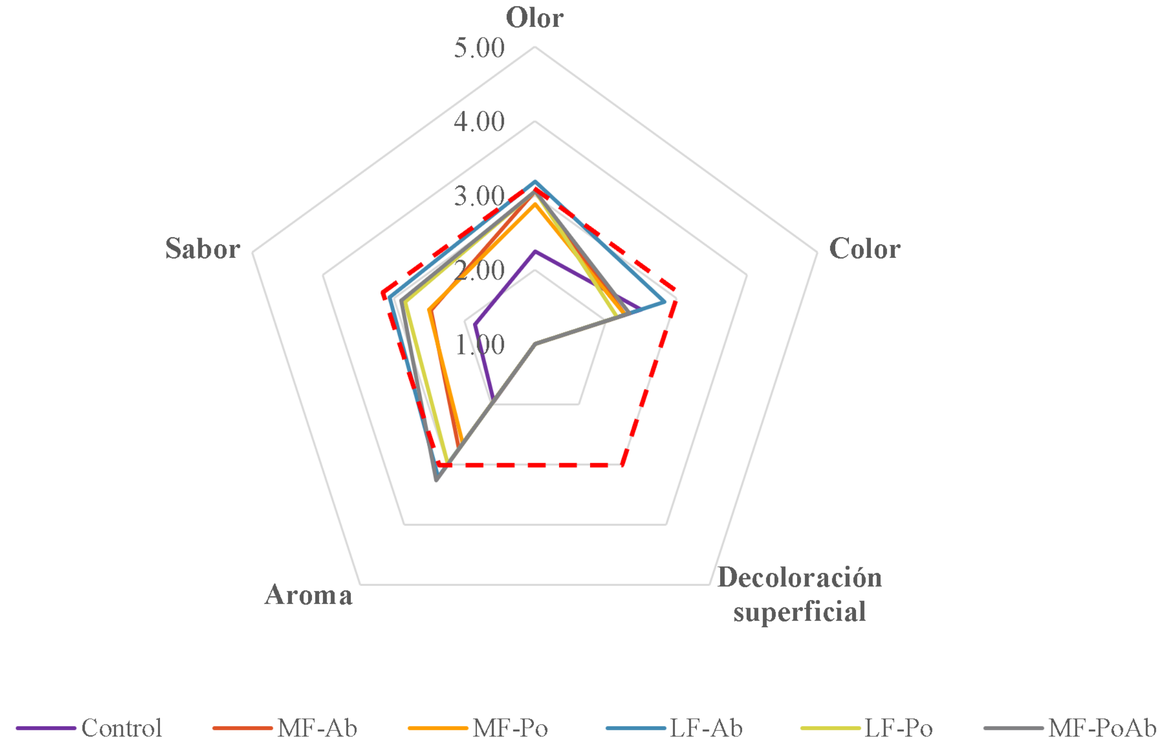
Sabor



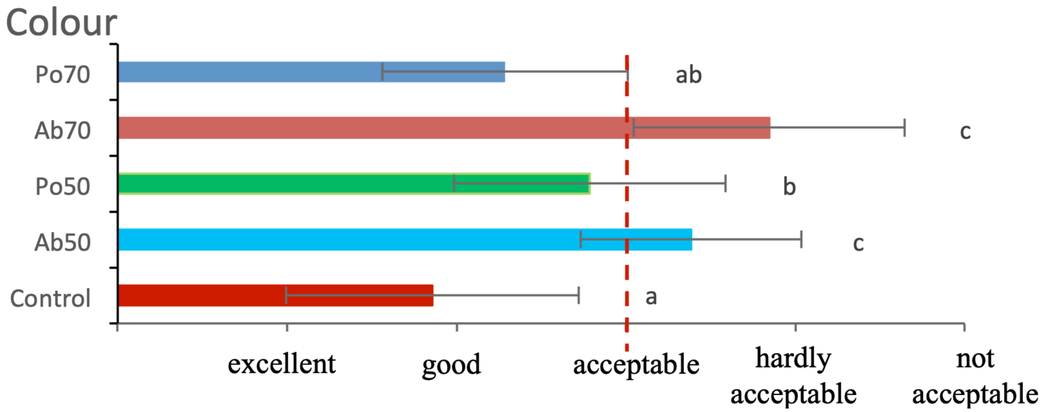


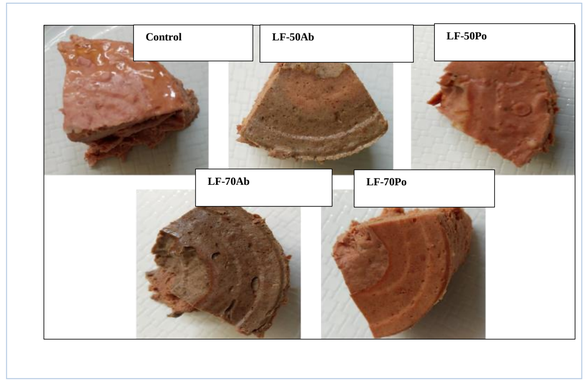
Sensorial

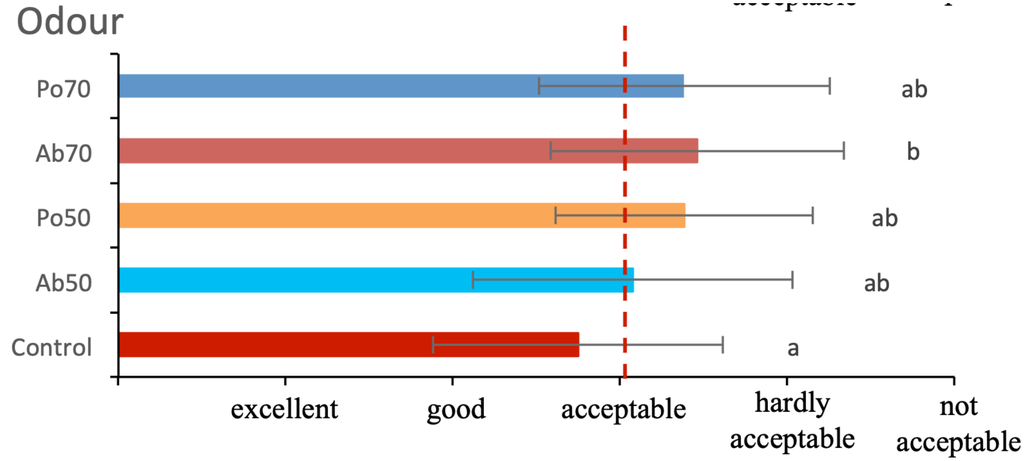

Control
MF-Ab
LF-Ab
MF-Po
LF-Po
MF-AbPo

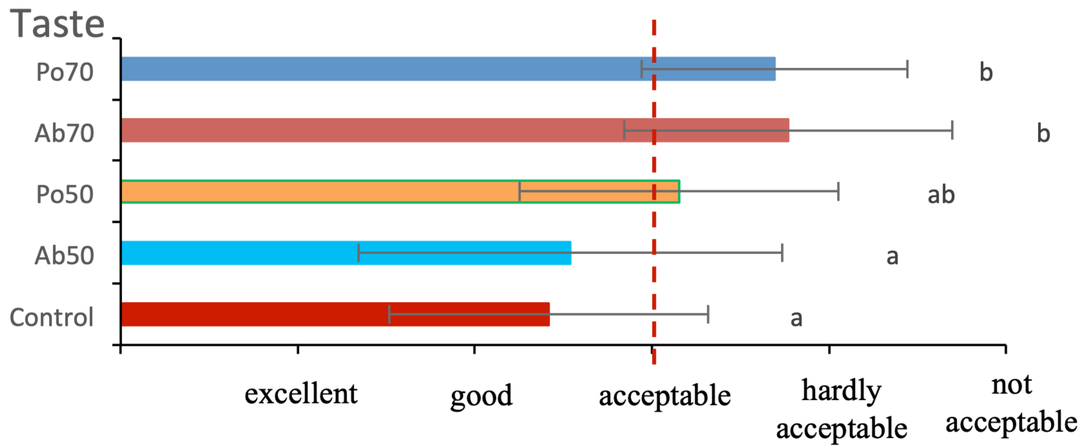

Olor
5.00
4.00
3.00
2.00
1.00
Color
Decoloración superficial
Aroma
Sabor
Control
MF-Ab
MF-Po
LF-Ab
LF-Po
MF-PoAb

Sensorial


Colour
Po70
Ab70
Po50
Ab50
Control
ab
c
b
c
a
excellent
good
acceptable
hardly acceptable
not acceptable


Control
LF-50Ab
LF-50Po
LF-70Ab
LF-70Po


Odour
Po70
Ab70
Po50
Ab50
Control
ab
b
ab
ab
a
excellent
good
acceptable
hardly acceptable
not acceptable


Taste
Po70
Ab70
Po50
Ab50
Control
b
b
ab
a
a
excellent
good
acceptable
hardly acceptable
not acceptable

Conclusiones

- Gran potencial/factibilidad económica
- Familiarización del consumidor
- Concentraciones intermedias
- Efecto en la salud

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¡Muchas Gracias!