Effect of feed grade glycerol on the meat quality of fattening pigs

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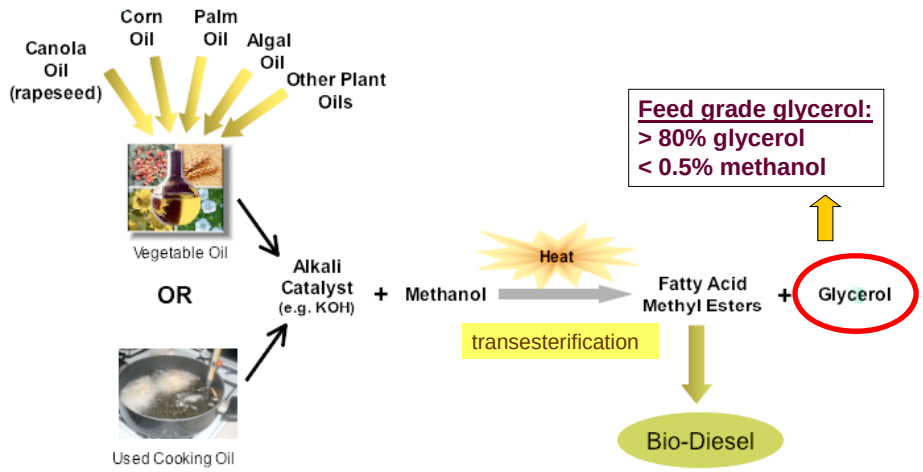
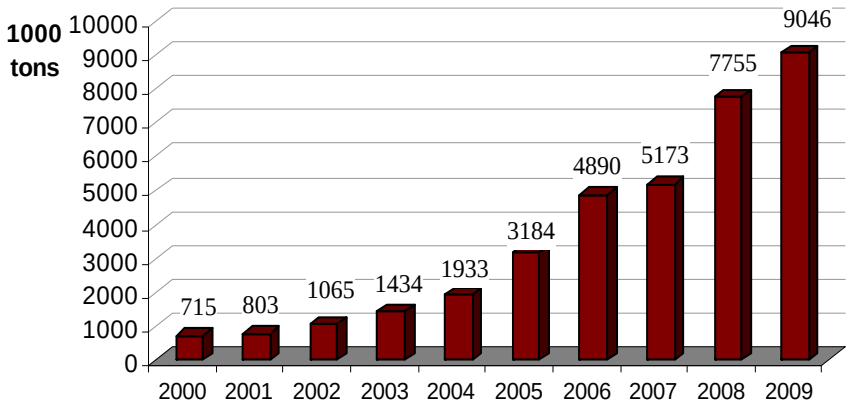
1st September 2011

Biodiesel production



source: http://sgth2.com/bio-diesel_faq

Biodiesel production in the EU 2000-2009



source: EBB statistics, 2010

Matherials and methods

Animals: 2 x 50 Norwegian Landrace x Duroc

Fattening period: 30 ⇒105 kg live weight (101 days)

Feeding diet:

		Growing diet (30-70 kg)		Finishing diet (70-105 kg)	
		Control	5% glycerol	Control	5% glycerol
Corn	%	42.3	37.1	35.0	29.9
Glycerol (86%)	**%**	**-**	**5.0**	**-**	**5.0**
Corn gluten	%	-	0.4	-	0.3
Crude protein	**%**	**17.40**	**17.30**	**15.77**	**15.56**
DE	**MJ/kg**	**13.90**	**14.02**	**13.59**	**13.57**

Matherials and methods

10 *Longissimus dorsi muscle* sample/treatment were collected to determine meat quality

Hungarian Meat Research Institute

- Colour
- Roasting loss
- Sensory analysis
- Warner-Bratzler shear force

University of West Hungary Department of Livestock Animal Nutrition

- Chemical compositon
- Fatty acid profile
- Defrosting loss
- Cooking loss

Statistical analysis: single-factor variance-analysis
GenStat 11R software (VSN International Ltd.)

Results

Carcass properties

	Control	5% glycerol	
Carcass weight (kg)	83.9±13.4	82.2±12.8	N.S.
Fat thickness (mm)	14.5±3.9	15.1±4.75	N.S.
Muscle thickness (mm)	55.3±6.0	55.2±7.5	N.S.
Loin meat (%)	59.9±2.0	59.4±2.7	N.S.
S EUROP class	E	E	

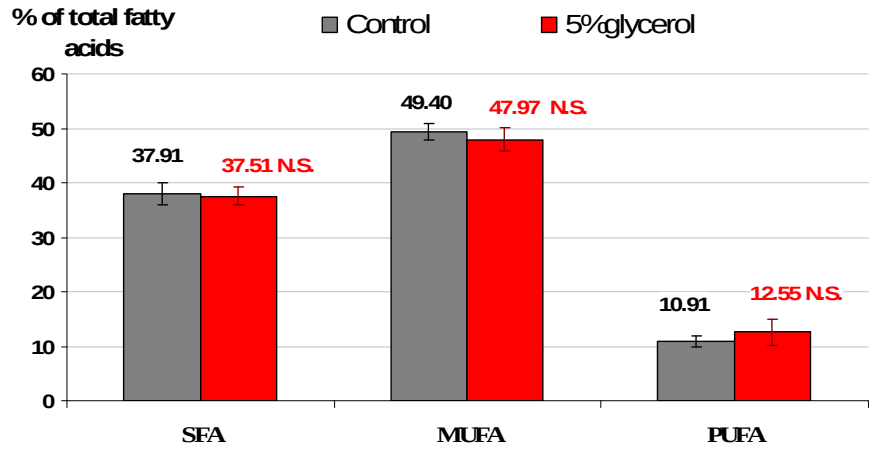
N.S.= not significant

Chemical composition (g/100 g meat)

	Control	5% glycerol	
Dry matter	27.53±0.61	27.10±2.1	N.S.
Protein	24.08±0.3	23.48±0.7	N.S.
Fat	1.75±0.5	2.04±0.8	N.S.
Ash	1.67±0.4	1.65±0.8	N.S.

Results

Fatty acid profile of longissimus dorsi



N.S.= not significant

SFA: saturated fatty acids
MUFA: monounsaturated fatty acids
PUFA: polyunsaturated fatty acids

Results

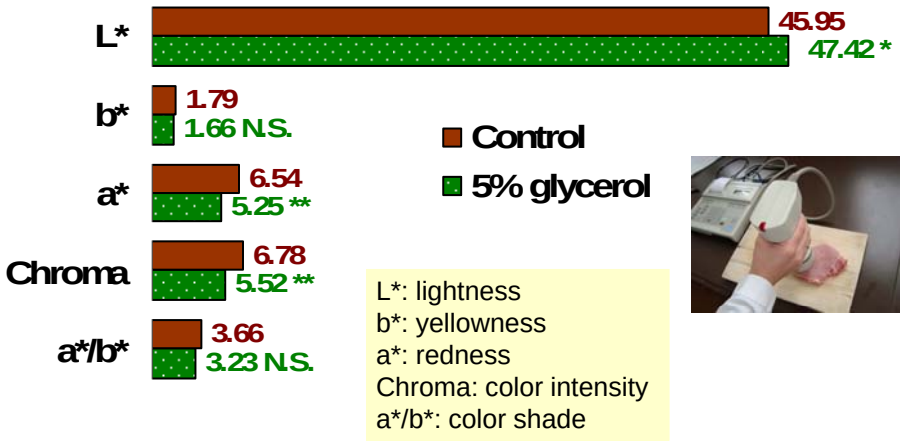
Fatty acid profile of longissimus dorsi

	Control	5%glicerin	F-probe
⇧ **C17:0**	**0.31±0.04^{a}**	**0.48±0.16^{b}**	0.007
⇩ **C18:1 n-9**	**43.35±1.27^{b}**	**41.72±2.08^{a}**	0.020
C18:2 n6	7.72±0.78^{a}	8.97±1.73^{a}	0.104
⇧ **C18:3 n3**	**0.99±0.04^{a}**	**1.12±0.11^{b}**	0.001
C20:5 n3	0.04±0.01^{b}	0.04±0.02^{b}	0.640
C22:6 n3	0.04±0.01^{a}	0.05±0.02^{a}	0.433
Σn-6	*9.70*±0.98^{a}	*11.18*±2.36^{a}	*0.114*
⇧ ***Σn-3***	***1.22*±0.04^{a}**	***1.37*±1.37^{b}**	*0.001*
n-6/n-3	*7.96*±0.70^{a}	*8.12*±1.34^{a}	*0.470*

Different superscripts within a row indicate significant differences (P<0.05)

Results

Color of meat slices

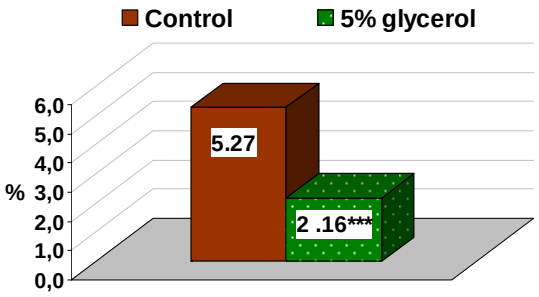


L*: lightness
b*: yellowness
a*: redness
Chroma: color intensity
a*/b*: color shade

** P<0.05* *** P<0.01* *N.S.= not significant*

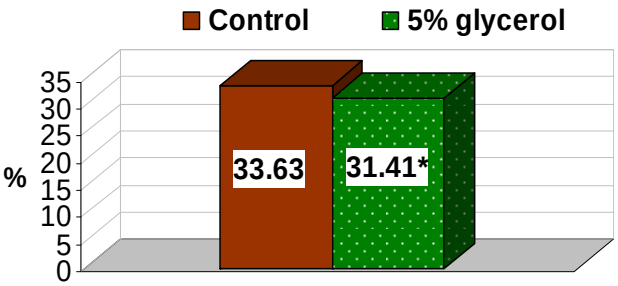
Results

Store:-12-20 ^{0}C, 1 week



Defrosting loss of meat

**** P<0.001*

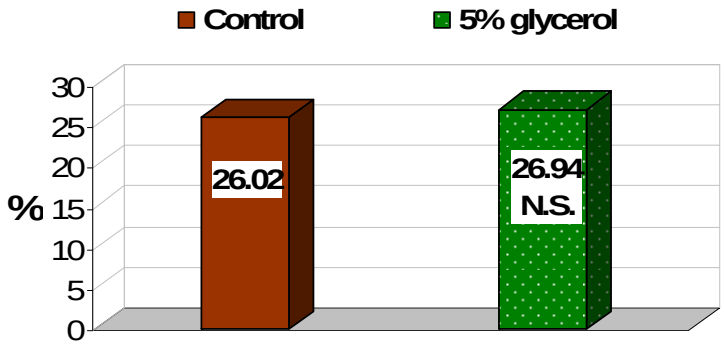


Cooking loss of defrosted meat

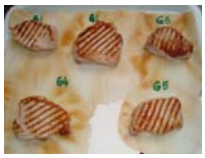
** P<0.05*

Cooking: 70 ^{0}C, 2 hours

Roasting loss of fresh meat

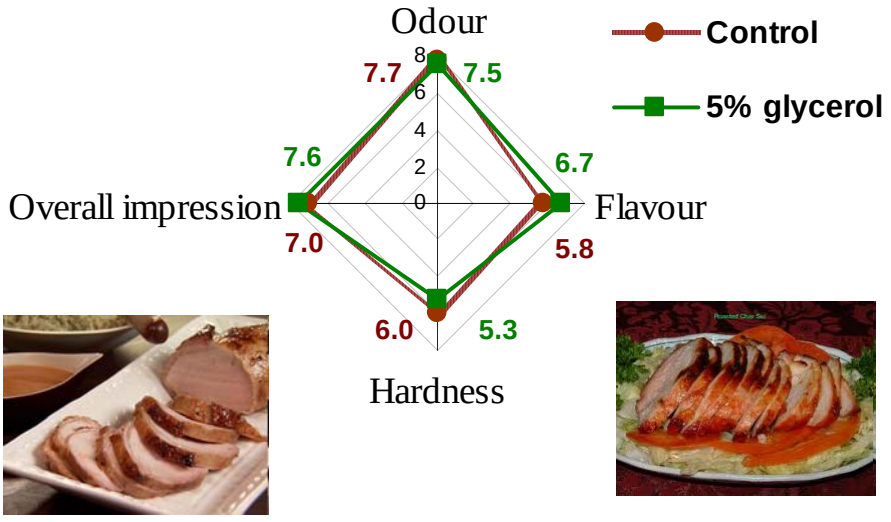


N.S.= not significant

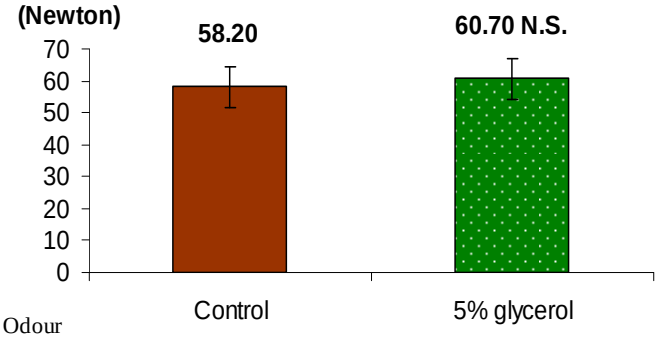


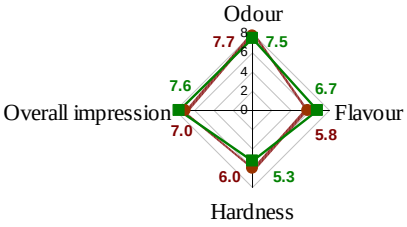
The slices were roasted in a contact grill oven one by one until the reaching of the core temperature of 72 ^{0}C.

Sensory properties of roasted pork chop



Warner Blatzer shear force values of roasted meat





N.S.= not significant

Conclusion

Our results proved that the substitution of maize with 5% feed grade glycerol did not modify adversely the quality of pork.

Thank you for your attention!