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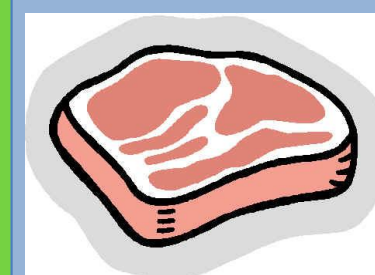
# A Comparative Analysis of Consumers' WTP for Milk and Meat from Cloned Animals in Canada

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## BACKGROUND

- The United States Food and Drug Administration in 2008 stated that "meat and milk from cattle, swine, and goat clones or their offspring are as safe to eat as conventional food we eat from those species now".
- Animal cloning is a complex process by which scientists copy the genetic or inherited traits of an animal. Somatic cell nuclear transfer is the process most often used in animal cloning (Vajta & Gjerris, 2006).
- Consumer preferences play a very important role in food policy, while science may determine what is safe; society will decide what is acceptable.

The commercial development of cloning technology, their offspring and derived products has sparked controversy in the food industry:

1) Genetic improvements allow producers to potentially lower prices, increases the quality of meat and milk products, and possibly increase resistance to diseases (Lewis et al., 2004; Wall et al., 2005).

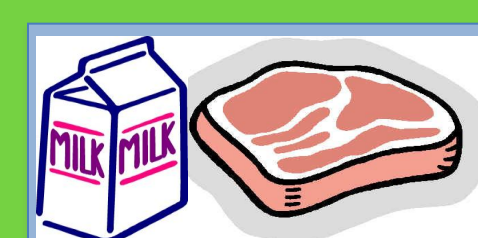
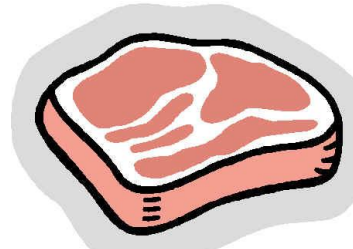
2) Consumers prefer non-cloned to cloned products and they strongly value labeling of cloned and organic products (Lusk and Brook, 2010). Consumers' willingness to pay for regulation to ensure cloned products are labelled is influenced by gender, bid amount, level of education, and knowledge of cloning (Jones et al., 2010).

We study the Canadian population for their preferences about purchasing meat and milk from cloned animals. -Comparable to a similar study (Lusk and Marette, 2010; Brooks and Lusk, 2010).



## OBJECTIVE

To analyze whether or not peoples' stated WTP for meat or milk products produced from cloned animals suggests the need for regulation of cloning within Canada.



## DATA

### Canadian National Surveys Demographic Variables

(Means and standard deviations of variables included in the model)

Demographic Facts	Cloned Meat	Cloned Milk
Age ( 7categories)	47.7 (12.99)	47.3 (13.35)
Male (1 if male, 0 otherwise)	0.503 (0.50)	0.475 (0.50)
Household size	2.24 (0.70)	2.19 (0.73)
Kids (1 if yes, 0 otherwise)	0.28 (0.45)	0.27 (0.44)
Education (5 categories, years of study)	14.10 (1.66)	13.55 (2.92)
Income (\$/1000)	67.21 (34.32)	54.2 (28.7)
Living in a city (%) ( 1 if yes, 0 otherwise)	0.635 (0.49)	0.664 (0.47)

\*Note: Standard deviations are in parentheses

## METHODS

Stated preference choice method was applied to elicit Canadian consumer preferences towards various attributes for cloned meat and milk and their off-spring products.

Strength of Stated Preference Method: Consumers can be asked about their willingness to purchase for any product, including those currently unavailable in the marketplace and the researcher can control the data collection process in order to ensure that price changes are uncorrelated with other variables of interest (Brooks & Lusk, 2010).

Two national surveys were conducted in the period of January-March 2010 across Canada with approximately 800 valid respondents for each survey.

### Experimental Design

#### Attributes and Attribute Levels in Cloned Ground Beef Choice Experiment

Attributes (Cloned Ground Beef)	Levels
Price (\$/kg)	8.79, 4.39,
Production Attribute	Meat from Non-cloned animals, Meat from Cloned animals, Meat from Offspring of Cloned animals
Percent Lean	80% (Lean), 90% (Extra Lean),
Saturated Fat Content	5%, 10%

#### Example of Cloned Ground Beef Choice Set

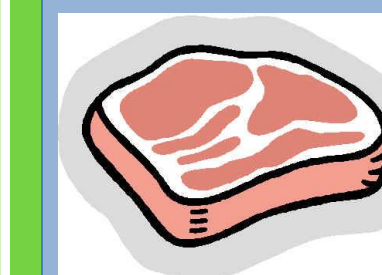
Ground Beef Attributes	A	B	C	D
Price (\$/kg.)	\$4.39/kg.	\$4.39/kg.	\$8.79/kg.	
Production Attribute	Meat from Non-cloned animals	Meat from Cloned animals	Meat from Offspring of Cloned animals	If options A, B, and C were all that was available at my local grocery store I would not purchase ground beef from that store.
Percent Lean	80% (Lean)	90% (Extra Lean)	80% (Lean)	
Saturated Fat Content	5%	10%	5%	
I would choose . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

#### Attributes and Attribute Levels in Cloned Milk Choice Experiment

Attributes (Cloned Milk)	Levels
Price (\$/4 litres)	5.99 , 3.99
Production Attribute	Milk from Non-cloned animals, Milk from Cloned animals, Milk from Offspring of Cloned animals
Fat Content	Skim milk, 1% Milk, 2% milk, Whole Milk,
Farm type	Conventional, Organic

#### Example of Cloned Milk Choice Set

Milk Attributes	A	B	C	D
Price (\$/4 litres)	\$3.99 for 4 litres	\$5.99 for 4 litres	\$3.99 for 4 litres	If options A, B, and C were all that was available at my local grocery store I would not purchase milk from that store.
Production Attribute	Milk from Non-cloned animals	Milk from Cloned animals	Milk from Offspring of Cloned animals	
Fat Content	Skim milk	Whole Milk	Whole Milk	
Farm type	Organic	Conventional	Organic	
I would choose . .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



## RESULTS

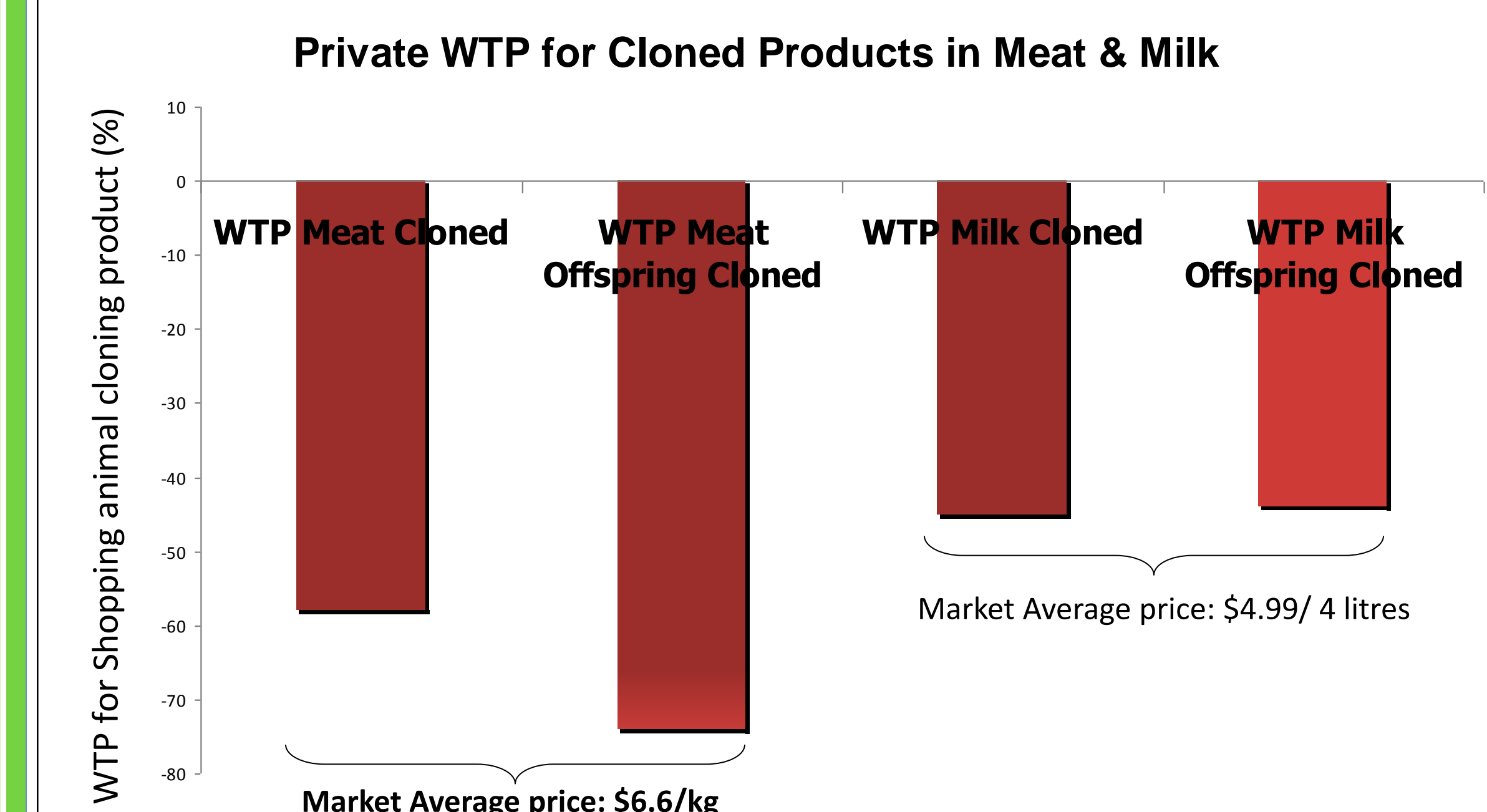


### Conditional Logit Regression Analysis for meat and milk from Cloned Animals and their Offspring's

Milk from Cloned Animals		Meat from Cloned Animals	
Variable	Coefficient	Variable	Coefficient
Price	-0.7016*** (0.0145)	Price	-0.35313*** (0.0081)
Neither Option	-4.39156*** (0.0821)	Neither Option	-3.30048*** (0.068937)
Milk from Cloned animals	-2.20886*** (0.169271)	Meat from Cloned animals	-3.07873*** (0.219789)
Milk from Offspring of Cloned animals	-2.0038*** (0.171782)	Meat from Offspring of Cloned animals	-2.47615*** (0.211274)
Whole Milk	-0.64961*** (0.19048)	Extra Lean	0.320001* (0.186518)
1% milk	-0.33432** (0.181826)	5% saturated fat	0.343305** (0.180516)
Skimmed milk	-0.78578*** (0.1856)		
Age x Offspring of Cloned animals	-0.06832** (0.022466)	Age x Offspring of Cloned animals	-0.12762*** (0.02731)
Age x Organic	-0.04389** (0.018665)	Age x Extra Lean	-0.05501** (0.024191)
Trust x Cloned animals	0.42691*** (0.058835)	Trust x Cloned animals	0.5149*** (0.071717)
Trust x Offspring of Cloned animals	0.516837*** (0.061693)	Trust x Offspring of Cloned animals	0.478457*** (0.072274)
Gender x Cloned animals	0.834127*** (0.058853)	Gender x Cloned animals	0.699805*** (0.073183)
Gender x Offspring of Cloned animals	0.739309*** (0.061328)	Gender x Offspring of Cloned animals L	0.741868*** (0.073981)
Gender x Organic	-0.10534** (0.050055)	Gender x 5% fat	0.121795** (0.060849)
Kids x Cloned animals	-0.18076** (0.071202)	Kids x Cloned animals	0.161673** (0.083139)
Kids x Organic	-0.13896** (0.059042)	Kids x Extra Lean	-0.13529* (0.072225)
Kids x Whole Milk	-0.22208*** (0.074823)	Kids x 5% fat	-0.13636** (0.070211)
Kids x Skimmed Milk	-0.1547** (0.0763)	Education x Cloned animals	0.066065* (0.036472)
Education x Organic	0.055686** (0.025579)	Education x Offspring of Cloned animals	0.092731** (0.037009)
Education x Whole Milk	-0.05961* (0.03388)	Education x 5% fat	0.053467* (0.031171)
Education x Skimmed Milk	0.056133* (0.033043)	Quebec x Cloned animals	-0.23408* (0.132786)
Rural x Offspring of Cloned animals	-0.28117*** (0.091214)	Quebec x Offspring of Cloned animals	-0.39519*** (0.129473)

Note: 1) Standard Errors are in the parentheses 2) \*\*\*, \*\*, \*, Significant at 1%, 5%, and 10% level

The regression analysis indicates that younger male, more highly educated respondents who also think other people can be trusted have more positive views towards meat and milk products produced by cloned animals.



## CONCLUSIONS

### COMPARATIVE FACTS



(Our Study)



(Lusk and Marette, 2010) (Brooks and Lusk, 2010)

Canadians are not WTP for meat and milk products produced from cloned animals and their offspring.

Canadian consumers are WTP more for meat products with lower saturated fat (5%), skim milk, and 1% milk products as compared to meat products with higher saturated fat (10%) and 2% milk products.

The Canadian consumers are WTP 58% and 74% less than the average market price (\$6.6/kg) for meat produced by cloned animal, and 45% and 44% less than the average retail price (\$4.99 for 4 litres) of milk produced by cloned animals or their offspring.

American People strongly preferred meat products from a non-cloned animal vs. a cloned animal.

American populations like Canadians enjoy decreases in saturated fat content in meat products. Also, skim, and 1% milk is more preferred compared to whole milk.

Americans are WTP 68% and 59% less than the average market price (\$ 2.99/lb) for meat produced by cloned animal, and their off spring. Also American consumers are WTP 57% and 65% more than the average price (\$4.49 per gallon) to avoid milk produced by cloned animals or their offspring.

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