Sector- and Economy-wide Effects of Terminating the Use of Anti-microbial Growth Promoters in Denmark

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Abstract

In Denmark the poultry industry and the National Committee for Pig Production, together with the feedstuff industry, decided to voluntarily abolish the use of all Anti-microbial Growth Promoters (AGP). The poultry industry abolished the use of AGP 15 February 1998 and the pig industry followed 1 March 1998 (for pigs over 35 kg) and 1 January 2000 (for pigs under 35 kg).

To evaluate the effects of the removal of AGP, data from both the poultry and pig industries were collected during a transition period for the removal of AGP from animal feed. Utilizing these production data, this paper calculates economy-wide effects of the removal of AGP using the Agricultural Applied General Equilibrium (AAGE) model of the Danish economy.

The results show that the long-term effects are a moderate decline in the production and export of pig meat, and a positive indirect effect on other industries including poultry due to lower rental rates for primary factor inputs (land, labour and capital). Production of pig meat is projected to decline by 1.4%, and exports by 1.7%. In the case of poultry, production and exports increase by 0.4 and 0.5%. The overall implication is a small decline in real GDP of 0.03% (363 mill DKK at 1995 prices), and a consumption decline of 0.03% - equivalent to 45 DKK per capita per year.

Although the cost in terms of real GDP and consumption are small, such cost analyses could be compared with expected benefit of the removal of AGP. These benefits have not been a part of this analysis, but only if they are determined or assumed to exceed the costs could AGP removal be said to be beneficial to society as a whole.

Introduction

In the early 1990s the Danish farmers were using Anti-microbial Growth Promoters (AGP) added to feed in the production of food animals. This practice entailed that these animals where exposed to anti-microbials for the most of there lives giving rise to concerns from consumers that the use of AGP posed a potential risk to public health by increasing the level of anti-microbial resistant bacteria in the human food gain.

In the light of these concerns the Danish farmers decided to voluntarily abolish the use of all AGP. The poultry industry abolished the use of AGP 15 February 1998 and the pig industry followed 1 March 1998 (for pigs over 35 kg) and 1 January 2000 (for pigs under 35 kg).

As a result, the quantity of anti-microbials used in food animals in Denmark has declined 54% from the peak in 1994 (205,686 kg) to 2001 (94,200 kg), representing the general change in Denmark from continuous use of anti-microbials for growth promotion to exclusive use of targeted treatment of specific animals for therapy under veterinary prescription (WHO, 2003).

Internationally these concerns about the use of AGP in the production of food animals has also been voiced and discussed in meetings in the World Health Organization (WHO) resulting in the publication of the WHO Global Principles for the Containment of Anti-microbial Resistance in Animals Intended for Food in June 2000 (WTO, 2000).

This of course makes the Danish case interesting for other countries contemplating to terminate the use of AGP, wherefore in this paper we try to highlight the impact of terminating the use of AGP has on production, trade and the national economy in Denmark.

This has been done by utilizing production data collected in the Danish poultry and pig industries together with an applied general equilibrium model of the Danish economy to evaluate the economy-wide effects of terminating the use of AGP in Denmark.

The paper starts by presenting the production data collected during a transition period for the removal of AGP from animal feed and the associated changes in production

costs. Next the model and scenarios are described, followed by the results and conclusion of the analysis.

Production data

Poultry

The Danish Poultry Council investigated how the removal of AGP influenced broiler productivity in Denmark by analysing data from 6815 flocks during the period November 1995 to July 1999. It was found that broiler weight produced per square meter and percentage deaths were not affected but that the feed conversion ratio increased marginally by 0.016 kg feed/kg broiler (1 %) (Emborg *et al.* 2001a*).*

In economic terms this increased feed requirement to produce 1 kg of broiler weight amounts to roughly 0.025 DKK, which compared to the estimated cost of adding AGP to broiler feeds of roughly 0.027 DKK/kg broiler almost exactly offsets the extra feed costs incurred (Emborg *et. al*. 2001b).

Pigs

The National Committee for Pig Production has operated a swine production records system for many years, recording productivity data in a representative sample of Danish pig herds. Of approximately 13,500 pig producers in Denmark, about 1,500 (11%) have participate in the scheme by submitting monthly production data. Based on these production records it has been possible to some extent at estimate the effects of terminating the use of AGP in pig production, given the conditions under which Danish pigs are reared.

The production records showed that the withdrawal of AGP was found to have had no, or very limited, effect on finishers and growers, but in the production of weaned pigs there were increased problems with post-weaning diarrhoea, a reduction in daily weight gain and increased post-weaning mortality (Callesen. 2002).

The average mortality in weaners increased from 2.9% (1995-1998) to 3.5% (1999-2001) after the termination of AGP eventhough the use of therapeutic anti-microbials increased. In addition to this the number of days to 100 kg body weight (birth to approximate slaughter date) decreased by 2.4 days from 173,9 in 1997 to 171.5 in 2001, but taking into account past trends in improvements in genetics and production technology, it would have been expected that pigs would have reached 100 kg in 169.9 days in 2001 if AGP had not been terminated (Calleson, 2002). Therefore, days to

100 kg body weight is estimated to have increased by 1.6 days due to the termination of AGP.

Change in production costs

An estimate of the cost associated with the productivity losses outlined above, incurred by removing AGP in the production of pigs has been calculated to be approximately 7.75 DKK per pig produced (WHO, 2003). A break down of these costs is shown in Table 1 below.

Table 1. Productivity reductions and cost per produced pig incurred by removing AGP

			DKK per pig produced
Excess mortality	0.6%	425 DKK/pig (30 kg)	2.55
Excess feeding days	1.6 days	1.10 DKK/day	1.75
Increased medication	25500 kg	value 53 million. DKK	2.25
Increased workload	30 sec./pig	145 DKK/hour	1.20
Increased use of organic acids in feed			1.00
Less cost of AGP in feed			-1.00
Total cost			7.75

Source: Estimates made with help from the Danish National Committee for Pig Production and members of WHO expert review panel, Foulum, Denmark. November 2002, (WHO, 2003)

In Table 2 it can be seen that the total cost of pig keeping increases by roughly 1.0 % due to the abolishment of AGP when the increased cost of production (DKK 7.75 per produced pig) is compared to the total cost of pig keeping per sow in Denmark.

Table 2. Estimated total cost increase for pig keeping in Denmark, percent

	1997/98	Sensitivity analysis	
		-25%	+25%
Produced pigs per sow	20.0	20.0	20.0
Extra production cost per pig produced DKK	7.75	5.81	9.69
Extra production cost per sow DKK	155	116	194
Total pig keeping cost per sow DKK	14832	14832	14832
Percentage increase in costs	1.05	0.78	1.31

Source: Economics of Agricultural Enterprises, Serie B. Economics of Agricultural Enterprises. Danish Research Institute of Food Economics and own calculation.

This estimated increase in production cost are of course uncertain to some degree and limited in that it does not include associated cost incurred by producers who have made modifications to production systems, although they may have been substantial in some cases. Therefore, two sensitivity analyses are also undertaken where pig pro-

duction costs are assumed to increase by 25 % more or 25 % less than the estimated 7.75 DKK, c.f. Table 2.

In the case of Poultry, the assumption is made that the savings associated with not purchasing AGP in the poultry industry do offsets the extra cost incurred due to the termination of the use of AGP in Denmark (increased feed conversion ratio).

In the following, the calculated percentage increases in costs of producing pigs (1.05 %) and poultry (0.0 %) are used to calculate the economy wide effects of removing AGP from animal feed in Denmark together with the two additional sensitivity analyses (±25 %).

Model

Where there are economy-wide interactions between industries, it is important to capture all impacts of changing specific domestic policies, both in the primary industry involved but also in secondary industries of the economy. Therefore in order to evaluate the economic consequences of abolishing AGP, an **A**gricultural **A**pplied **G**eneral **E**quilibrium (AAGE) model of the Danish economy is used.

In the so-called AAGE model of the Danish economy there are five types of agents, namely: industries; capital creators; households; governments and foreigners. The current database of the model identifies 68 industries producing 76 commodities (see appendix A). For each industry there is an associated capital creator. The capital creators each produce units of capital that are specific to the associated industry. There is a single representative household and a single government sector. Finally, there are foreigners, whose behaviour is summarised by export demand functions for Danish products, and by supply functions for imports to Denmark.

The nature of markets and prices

AAGE determines supplies and demands of commodities through the optimising behaviour of agents in competitive markets. Optimising behaviour also determines industries' demands for labour and capital.

The assumption of competitive markets implies equality between the producer price and the marginal cost in each industry. Demand is assumed to equal supply in all markets other than the labour market (where excess supply conditions can hold). The government intervenes in markets by imposing sales taxes on commodities. This

places wedges between the prices paid by purchasers and prices received by the producers. The model recognises margin commodities (e.g. retail trade and freight) that are required for each market transaction (the movement of a commodity from the producer to the purchaser). The costs of the margins are included in purchasers' prices.

Demand for inputs to be used in the production of commodities
AAGE recognises two broad categories of inputs: intermediate inputs and primary factors. Firms in each industry are assumed to choose the mix of inputs, which minimises the costs of production for their level of output. They are constrained in their choice of inputs by nested production technologies (see appendix B). For the land-using industries (see appendix A), AAGE specifies nested substitutions between:

(a) capital, labour, energy and herbicides (CLEH);
(b) land, fertiliser and insecticides (LFI);
(c) CLEH and LFI (CLEHLFI); and
(d) CLEHLFI and an aggregate of remaining intermediate inputs

For non-land using industries substitution is allowed between capital, labour and energy (CLE) and between CLE and aggregate non-energy intermediate inputs.

Household demand
The representative household buys bundles of goods to maximise a utility function subject to a household expenditure constraint. Bundles are combinations of imported and domestic goods.

Demand for inputs to capital creation and the determination of investment
Capital creators for each industry combine inputs to form units of capital. In choosing these inputs they minimise costs, subject to technologies similar to that used for current production; the only difference being that they do not use primary factors. The use of primary factors in capital creation is recognised through inputs of the construction commodity.

Government demand for commodities
The government demands commodities. In AAGE, there are several ways of handling these demands, including: (i) endogenously, by a rule such as moving government expenditures with household consumption expenditure or with domestic absorption; (ii) endogenously, as an instrument which varies to accommodate an exogenously de-

termined target such as a required level of government deficit; and (iii) exogenously. In this paper government demand changes follow household consumption expenditures.

Foreign demand (international exports)
Two categories of exports are defined. Traditional, which are the main exported commodities and non-traditional. Traditional export commodities face individual downward-sloping foreign demand curves. The commodity composition of aggregate non-traditional exports is treated as a Leontief aggregate. Total demand is related to the average price via a single downward-sloping foreign demand curve. Contrary to many conventional agricultural products, all organic products are assumed to be traditional export commodities.

Demand for foreign imports
For all industries, AAGE includes the standard Armington specification for imported and domestically produced inputs. This assumes that users of a given commodity regard the domestic and the imported varieties of this commodity as imperfect substitutes. The Armington assumption is also used in input demands for industry investment and in household demands for consumption.

Computing solutions for AAGE
AAGE is a system of non-linear equations. It is solved using GEMPACK, a suite of programs for implementing and solving economic models. A linear, differential version of the AAGE equation system is specified in syntax similar to ordinary algebra. GEMPACK then solves the system of non-linear equations as an Initial Value problem, using a standard method, such as Euler or midpoint. For details of the algorithms available in GEMPACK, see Harrison and Pearson (1996).

Scenarios and expected results

A baseline is constructed to introduce all ongoing policy developments and known shocks to the economy so as to ensure that the policy scenario is undertaken in an economy where all known developments and shocks are accounted for, with the exception of removing AGP. The Baseline takes the economy from the model's initial year (1995) to 2010, and the effects of removal of AGP are evaluated in the year 2010.

We construct the AGP scenarios as a change in the total factor productivity (TFP). This is because the model has no explicit treatment of AGP. We use the calculated percentage increases in production costs (from Table 2) to reduce the TFP so that the unit cost of production increases by 1.05 % for pig production.

Two sensitivity analyses are also undertaken where the cost per produced pig is increased/decreased by 25 % cf. table 2.

Expected results from the analysis
The removal of AGP increases the unit cost of pig production. A higher unit cost requires a higher product price if profits are to remain unchanged. Yet a higher product price invites lower demand. A decline in demand/production releases resources from the pig sector, which can then be used in other sectors of the economy. The increased supply of resources to other sectors in the economy lowers the price and required rent of these resources. A reduction in the required rental rates tends to favour those industries that are not affected by the removal of AGP. As the production of pigs only accounts for a minor fraction of total national production, the effects on the rest of the economy are expected to be moderate. The expected negative impact on pig production is expected to lower the demand for cereal (feed grains), exerting downward pressure on cereal prices. In turn, this is expected to benefit the cattle and poultry sectors, which use feed grains. This should result in an increased poultry production and increased milk quota rents (the cattle sector is effectively constrained by the quota).

Results

This section presents results for production, exports and the macroeconomic performance of the calculated AGP scenario. The presentation focuses on the results for the primary agricultural and associated processing sectors[1].

Production and exports
The production of live and processed pigs falls by 1.4 % cf. Table 3. This effect is due to the AGP removal working as an increase in unit cost, which in the longer run requires higher product prices, lowering demand for the product. The increase in unit cost also affects the export possibilities for processed pig meat, which declines by 1.7 %. A large part of cereal production is used for feed purposes, and the reduced production of pigs also causes cereal production to decline by -0.1 %.

[1] A more thorough presentation of the *Baseline* scenario can be found in Jacobsen (2001).

Even though the Baseline is not a subject of this paper it worth noting that the production of pigs is expected to grow by 30.5 % from 1995 to 2010 (Jacobsen 2001). The removal of AGP is therefore estimated to reduce this growth to 28.7 %.

The reduction in the production and processing of pigs leads to a lower demand for labour and new capital goods in these industries, resulting in a minor reduction in the wage rate and the price of new capital goods, cf. Table 4. This effect favours other industries not affected by the removal of the AGP since lower factor prices reduce unit costs causing production and exports to increase for these industries. Lower factor prices and lower price of cereals benefits poultry production, which is seen to increase by 0.4 % while the processing of poultry meats increases by 0.4 % and export volume increases by 0.5 %.

Table 3. Consequences of abolishing AGP, percentage changes

	Production	Export
Agriculture:		
Cereal	-0.1	0.1
Oilseed	0.2	0.1
Potatoes	0.1	0.1
Sugar beet	0.0	
Roughage	0.0	
Cattle, live animals	0.0	
Milk	0.0	
Pig, live animals	-1.4	
Poultry and eggs	0.4	
Fur farming	0.1	
Horticulture	0.1	0.1
Manure	-0.6	
Processing:		
Cattle meat	0.0	0.1
Pig meat	-1.4	-1.7
Poultry meat	0.4	0.5
Dairy	0.0	0.1
Sugar refineries	0.0	0.1
Other (selected):		
Processed fruit and vegetables	0.0	0.1
Bread, grain mill and cakes	0.0	0.1
Bakery shops	0.0	0.0
Beverage and Tobacco	0.0	0.1
Agricultural services, forestry and fisheries	0.0	0.1
Textile, wood, paper and publishing	0.0	0.1
Basic chemicals	0.1	0.1
Construction incl. Supply	0.0	0.1
Metals products	0.1	0.1
Public services and utilities	0.0	0.1
Retail and wholesale margins	0.0	0.1
Private services	0.0	0.1

Macroeconomic results

The macroeconomic consequences of AGP removal are moderate. Real GDP falls by 0.03 % or 363 million DKK at 1995 prices. This is the net result of the reduced production of pigs and cereals on the one hand, and the increased production in most other industries due to lower rental rates for primary factor inputs on the other hand.

Lower rental rates also affect real private and public consumption[2] falling by -0.03 %. This corresponds to a lower real value of private consumption of 45 DKK per capita per year.

The resulting reallocation of primary factor inputs results in an economic state where all factor input are a little less productive in the aggregate. All factors of production receive lower rental rates and the aggregate capital stock has somewhat declined, reflecting an economic state where production potential has decreased slightly.

Table 4. Macroeconomic consequences of abolishing AGP

	2010-Level[3]	AGP removal	
	Billion 1995-DKK	Million DKK	Percent
Real GDP	1426.1	-363	-0.03
Real private consumption	694.7	-234	-0.03
Real public consumption	353.8	-119	-0.03
Real investments	253.1	-35	-0.01
Real stocks	39.3	0	0.00
Real exports	412.6	17	0.00
Real imports	319.0	-38	-0.01
Real capital stock			-0.02
GDP deflator			-0.03
Consumer price index			-0.02
Price of investment goods			-0.03
Terms of Trade			-0.00
Nominal wage rate			-0.06
Price of agricultural land			-1.37

Abolishing the use of AGP also leads to a slightly lower (-1.37 %) price of agricultural land. The mechanism for this is the reduced demand for feed grains, reducing profitability in the cereals sector.

[2] The two consumption categories are equalised in the so-called model closure.
[3] 1995-DKK in the year 2010

Sensitivity analysis

The results of the sensitivity analysis show that changes to pig production, real GDP and land prices vary with plus minus 25 % in accordance with the higher/lower estimated cost of removing AGP.[4] Therefore the results presented in this paper are sensitive to the initial estimation of increased cost due to the abolishment of AGP. The results of the sensitivity analysis are shown in appendix C.

Concluding remarks

This paper has analysed the economy wide implication of the unilateral Danish removal of Anti-microbial Growth Promoters in the production of pigs and poultry. The analysis shows that the long-term effects are a moderate decline in the production and export of pig meat, and positive indirect effects on other industries due to lower rental rates. Interestingly, positive indirect effects mostly impact the poultry sector, which also abolish the use of AGP from production. The overall implication is a small decrease in real GDP and consumption.

The decrease in the production of pig meat should be seen in the light of the baseline where pig production is expected to increase by 30.5 % over the 15 year period or 1.8 % per year on average. Removing AGP from pig production reduces this growth in production to 28.7 % which is equivalent to an annul growth rate of 1.7 %, offsetting the ongoing expansion of the pig sector by approximately one year.

The sensitivity analysis undertaken in this paper show, that the results are sensitive to the initial estimation of the increased costs of abolishing AGP.

Even though the cost in terms of real GDP and consumption are small, cost analysis such as the one presented could be compared with expected benefit of the removal of AGP. These benefits have not been a part of this analysis and only if the benefits are determined or assumed to exceed the cost could such a removal be said to be beneficial to society as a whole.

[4] Even though the model is non-linear the shock to the economy are so small that second round effects and non-linearity only plays a minor role to model results.

One of these benefits, not included in this analysis, could be increased consumer confidence in Danish pig/poultry meat, which could give some competitive advantage in the global market place or even retain access to some valuable markets in the future.

Naturally, the results found should be evaluated in light of the assumptions employed. Compared with other, partial equilibrium, economic analysis the present analysis takes into account the economic linkages between the individual agricultural sectors and between the agricultural sectors and the industrial sectors, and consumer preference or willingness to pay. Furthermore, the analysis has taken into account the derived cost and price effects and the implications of explicitly representing the overall macroeconomic budgetary restrictions. The simulations have also been undertaken with a national AGE model assuming unilateral Danish policy initiatives, as well as it has been assumed that the removal of the AGP does not affect consumer preferences domestically or on the export markets for Danish pig and poultry meat.

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Appendix A

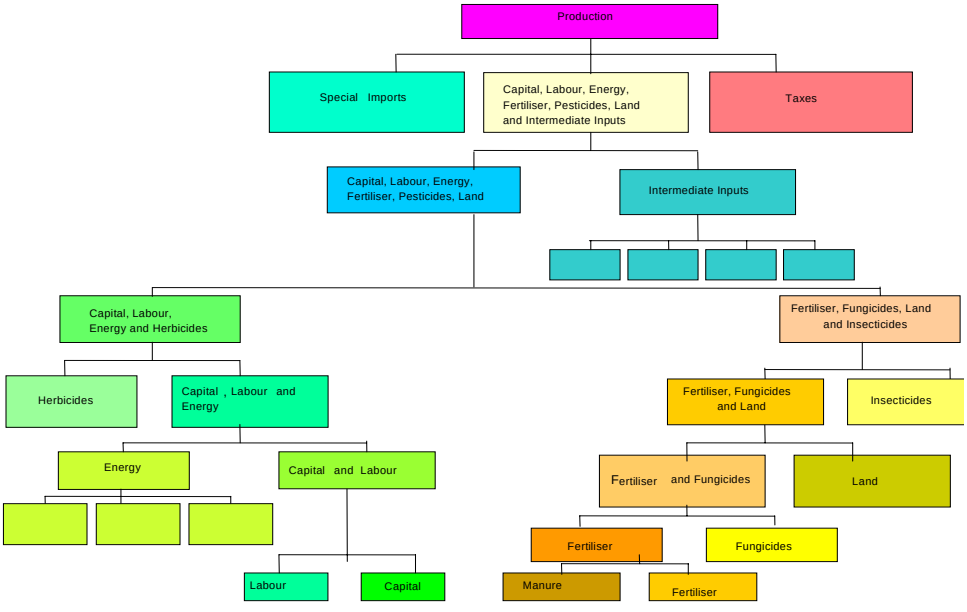
Table A1. Industries and commodities in Organic-AAGE

	Industries			Commodities	
*#	1-2	Cereal	*	1-2	Cereal
*#	3-4	Oil seeds	*	3-4	Oil seeds
*#	5-6	Potatoes	*	5-6	Potatoes
*#	7-8	Sugerbeets	*	7-8	Sugerbeets
*#	9-10	Roughage	*	9-10	Roughage
*	11-12	Meat cattle and milk producers	*	11-12	Meat cattle
*	13-14	Pigs	*	13-14	Milk
*	15-16	Poultry	*	15-16	Pigs
	17	Hunting and fur farming, etc.	*	17-18	Poultry
*#	18-19	Horticulture		19	Hunting and fur farming, etc.
	20	Agricultural services, etc.	*	20-21	Horticulture
	21	Forestry		22	Agricultural services, etc.
	22	Fishing		23	Forestry
	23	Extraction of coal, oil and gas		24	Fishing
*	24-25	Cattle-meat products		25	Extraction of coal, oil and gas
*	26-27	Pig-meat products	*	26-27	Cattle-meat products
*	28-29	Poultry-meat products	*	28-29	Pig-meat products
	30	Fish products	*	30-31	Poultry-meat products
*	31-32	Processed fruit and vegetables		32	Fish products
	33	Processed oils and fats	*	23-34	Processed fruit and vegetables
*	34-35	Dairy products		35	Processed oils and fats
*	36-37	Starch, chocolate products, etc.	*	36-37	Dairy products
*	38-39	Bread, grain mill and cakes	*	38-39	Starch, chocolate products, etc.
*	40-41	Bakery shops	*	40-41	Bread, grain mill and cakes
*	42-43	Sugar factories and refineries	*	42-43	Bakery shops
	44	Beverage production	*	44-45	Sugar factories and refineries
	45	Tobacco manufacture	*	46-47	Beverage production
	46	Textile, wearing apparel and leather		48	Tobacco manufacture
	47	Manufactured wood and glass products		49	Textile, wearing apparel and leather
	48	Paper products and publishing		50	Manufactured wood and glass products
	49	Oil refinery products		51	Paper products and publishing
	50	Basic chemicals		52	Oil refinery products
	51	Fertiliser		53	Basic chemicals
	52	Agricultural chemicals nec		54	Fertiliser
	53	Non-metallic building material		55	Agricultural chemicals nec
	54	Metal products		56	Non-metallic building material
	55	Machinery and non-transport equipment		57	Metal products
	56	Transport equipment		58	Machinery and non-transport equipment
	57	Electricity		59	Transport equipment
	58	Gas		60	Electricity
	59	Steam and hot water		61	Gas
	60	Construction		62	Steam and hot water
	61	Motor vehicles service		63	Construction
	62	Wholesale trade		64	Motor vehicles service
	63	Retail trade		65	Wholesale trade
	64	Freight transport		66	Retail trade
	65	Financial and property services		67	Freight transport
	66	Transport and communication services		68	Financial and property services
	67	Public services		69	Transport and communication services
	68	Dwelling ownership		70	Public services
				71	Dwelling ownership
				72	Coal imports
				73	Manure
				74	Fungicide
				75	Insecticides
				76	Herbicide

* Both conventional and organic product/production. # Land using industries.

Appendix B Nesting structure

Figure B1. Nesting structure of Organic - AAGE



Appendix C, Result of sensitivity analysis

Table C.1. Consequences of abolishing AGP, percentage changes

	Production			Export		
	AGP-25%	**AGP**	AGP+25%	AGP-25%	**AGP**	AGP+25%
Agriculture:						
Cereal	-0.088	**-0.118**	-0.148	0.081	**0.109**	0.135
Oilseed	0.115	**0.155**	0.193	0.081	**0.109**	0.135
Potatoes	0.077	**0.104**	0.129	0.081	**0.109**	0.135
Sugar beet	0.000	**0.000**	0.000			
Roughage	0.015	**0.020**	0.025			
Cattle, live animals	0.006	**0.008**	0.010			
Milk	0.006	**0.008**	0.009			
Pig, live animals	-1.038	**-1.394**	-1.734			
Poultry and eggs	0.269	**0.362**	0.451			
Fur farming	0.064	**0.086**	0.107			
Horticulture	0.064	**0.086**	0.107	0.081	**0.109**	0.135
Manure	-0.481	**-0.646**	-0.804			
Processing:						
Cattle meat	0.008	**0.010**	0.013	0.081	**0.109**	0.135
Pig meat	-1.032	**-1.385**	-1.723	-1.299	**-1.743**	-2.169
Poultry meat	0.273	**0.367**	0.457	0.338	**0.454**	0.566
Dairy	0.009	**0.013**	0.016	0.081	**0.109**	0.135
Sugar refineries	0.010	**0.014**	0.017	0.081	**0.109**	0.135
Other (selected):						
Processed fruit and vegetables	0.019	**0.026**	0.032	0.081	**0.109**	0.135
Bread, grain mill and cakes	0.028	**0.038**	0.047	0.081	**0.109**	0.135
Bakery shops	-0.011	**-0.015**	-0.019	0.000	**0.000**	0.000
Beverage and Tobacco	0.036	**0.049**	0.061	0.081	**0.109**	0.135
Agricultural services, forestry and fisheries	-0.019	**-0.025**	-0.031	0.081	**0.109**	0.135
Textile, wood, paper and publishing	0.034	**0.045**	0.056	0.081	**0.109**	0.135
Basic chemicals	0.056	**0.075**	0.094	0.081	**0.109**	0.135
Construction incl. Supply	-0.006	**-0.008**	-0.010	0.081	**0.109**	0.135
Metals products	0.054	**0.072**	0.090	0.081	**0.109**	0.135
Public services and utilities	-0.022	**-0.029**	-0.037	0.081	**0.109**	0.135
Retail and wholesale margins	0.004	**0.006**	0.007	0.081	**0.109**	0.135
Private services	0.000	**0.000**	0.000	0.081	**0.109**	0.135

Table C.2. Macroeconomic consequences of abolishing AGP

		AGP-25%		**AGP**		AGP+25%	
	Billion 1995-DKK	Million DKK	Percent	**Million DKK**	**Percent**	Million DKK	Percent
Real GDP	1426.1	-270	-0.019	**-363**	**-0.025**	-452	-0.032
Real private consumption	694.7	-174	-0.025	**-234**	**-0.034**	-291	-0.042
Real public consumption	353.8	-89	-0.025	**-119**	**-0.034**	-148	-0.042
Real investments	253.1	-26	-0.010	**-35**	**-0.014**	-44	-0.017
Real stocks	39.3	0	0.000	**0**	**0.000**	0	0.000
Real exports	412.6	13	0.003	**17**	**0.004**	21	0.005
Real imports	319.0	-29	-0.009	**-38**	**-0.012**	-48	-0.015
Real capital stock			-0.013		**-0.017**		-0.021
GDP deflator			-0.022		**-0.029**		-0.036
Consumer price index			-0.017		**-0.023**		-0.028
Price of investment goods			-0.022		**-0.029**		-0.036
Terms of Trade			-0.001		**-0.001**		-0.001
Nominal wage rate			-0.042		**-0.057**		-0.071
Price of agricultural land			-1.021		**-1.371**		-1.706