

*Titel: Consumer Evaluation of Environmental and Animal Welfare Labelling:
Estimating the willingness to pay for different types of eggs.*

Abstract:

Marginal willingness to pay for eggs carrying different labels is estimated using observed Danish purchase data on individual level. Among other things the labels indicate environmental features and different levels of animal welfare for the hens that produce the eggs. The data on eggs are part of a very comprehensive panel data set covering household purchases of non-durables during a five year period. For each family a wide range of background characteristics are available. Detailed data on eggs are available during the one year period from July 1999 to June 2000 used in these estimations,

Compared to simple statistics, such as the average market share of different egg types, econometric estimations make it possible to disentangle the effect of labels from the effects of e.g. differences in prices. Discrete models such as the multinomial logit make it particularly simple to estimate the willingness to pay for different characteristics of goods, in this case different labels. Had the purpose been to estimate substitution effects, a continuous model would have been used instead.

The estimations are conducted using the new and flexible Mixed Multinomial Logit model (MMNL) also known as Random Parameter Logit (RPL). Mixed multinomial logit allows heterogeneity among households by letting the parameters of the household utility functions be drawn from a common distribution instead of restricting them to be identical for all households. Estimating the parameters of the *distribution* of the parameters of the utility functions yields not only a measure of the marginal willingness to pay for different types of eggs, but also a measure of the degree of heterogeneity among the households.

The eggs are divided into battery eggs ('buræg'), barn eggs ('skrabe æg'), free-range eggs ('fritgående') and organic eggs ('økologiske') and the marginal willingness to pay for the three last types relative to battery eggs are estimated. The marginal willingness to pay for different types of eggs turns out to vary with the chain of stores in which the purchase is made. Econometric estimations using store-level data reveals that customers in some stores (e.g. Superbrugsen) are generally willing to pay for labels indicating environmental and animal friendly production methods, while customers in other stores (e.g. Bilka) are reluctant to do so. Combining data from many different stores leads to contra-intuitive results caused by the high level of heterogeneity among customers, prices and variety in the different stores.

It is found that models allowing the consumers' evaluation of the different labels to vary with background characteristics, such as the geographical location of the household residence, are significantly better than models ignoring background variables completely. Models allowing the evaluation to vary with attitudes, such as attitude to

branded goods, are also significantly better than the model ignoring these effects. The effect of the age of the main buyer is, in most cases, not significant.

It is reasonable to expect the value of different labels to vary between households. Animal welfare may be very important to some households, but have little or no value in other households. These differences are perceived as ‘heterogeneity of preferences’ in the econometric model. The labels ‘barn eggs’ and ‘free-range eggs’ mainly indicates increased animal welfare, whereas the ‘organic’ label indicates a more environmentally friendly production as well as a higher level of animal welfare. Some households may also perceive the organic eggs as being healthier than other egg types because the hens are fed with organic feed. The heterogeneity of marginal willingness to pay for organic eggs can therefore be induced by differences in the perception and evaluation of at least three different attributes, whereas the heterogeneity of marginal willingness to pay for barn and free-range eggs is expected to arise only from differences in perception and evaluation of animal welfare. Data supports this hypothesis as the estimated heterogeneity of marginal willingness to pay is generally higher for organic eggs than for the two other egg types.

More information in working paper #6: “Consumer Evaluation of Environmental and Animal Welfare Labelling: An Econometric Analysis on Panel Data Using Mixed Multinomial Logit” at www.akf.dk/organicfoods