Beneris

Project no: 022936
Project acronym: Beneris
Project title: Benefit-risk assessment for food: an iterative value-of-information approach

Instrument: STP-Specific Targeted Project

D25 Decision support system

Due date of deliverable:	**1 December, 2007**
Actual submission date:	**7 November, 2007** (paper submission with the 2nd-year report)
Dissemination level:	**PU**
Start date of project:	**April, 1st 2006**
Duration:	**3,5 years**

Organisation name of the lead contractor for this deliverable: **Technical University of Delft**

D25 "**Decision support system**" was delivered as a presentation by TU Delft in the Midterm meeting (Helsinki, November 7-9, 2007). The presentation slides are shown below.

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Method and Models

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5 Nov 2007

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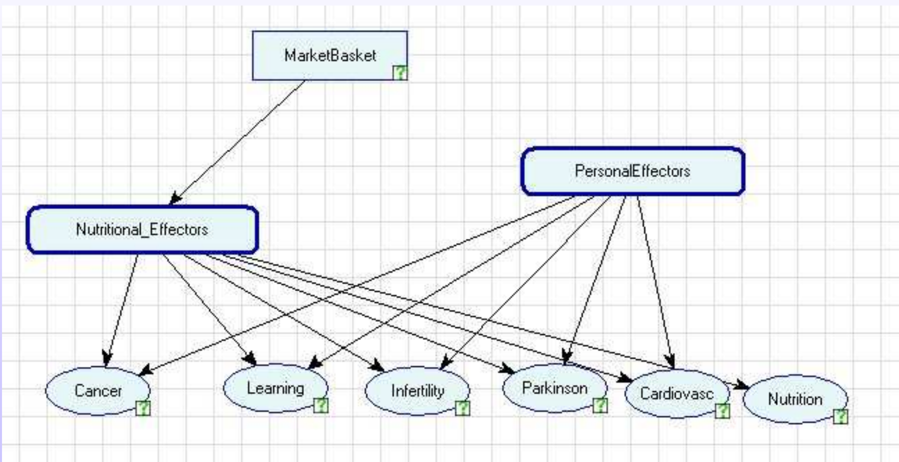
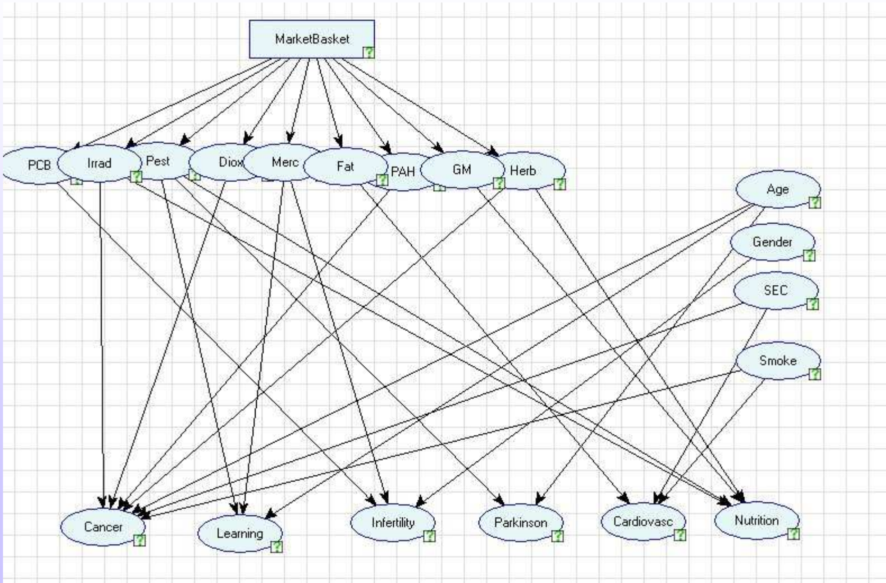
Original Target: BBN for food risk-benefit tradeoff



Expanded BBN



Multiple stressors, Multiple endpoints

P = Prob of endpoint

$(x_1, x_2, \ldots, x_n)$ values of effector variables

$$\ln\left(\tfrac{P}{1-P}\right) = f(x_1, x_2, \ldots, x_n) \approx f(x^0) + \sum_{i=1}^{n} f_i^{(1)}(x^0)\cdot(x_i - x_i^0) + \sum_{i=1}^{n} \frac{f_i^{(2)}(x^0)}{2!}\cdot(x_i - x_i^0)^2 + \sum_{i=1}^{n-1}\sum_{j=i+1}^{n} f_{ij}^{(2)}(x^0)\cdot(x_i - x_i^0)\cdot(x_j - x_j^0) + HOT \qquad (1)$$

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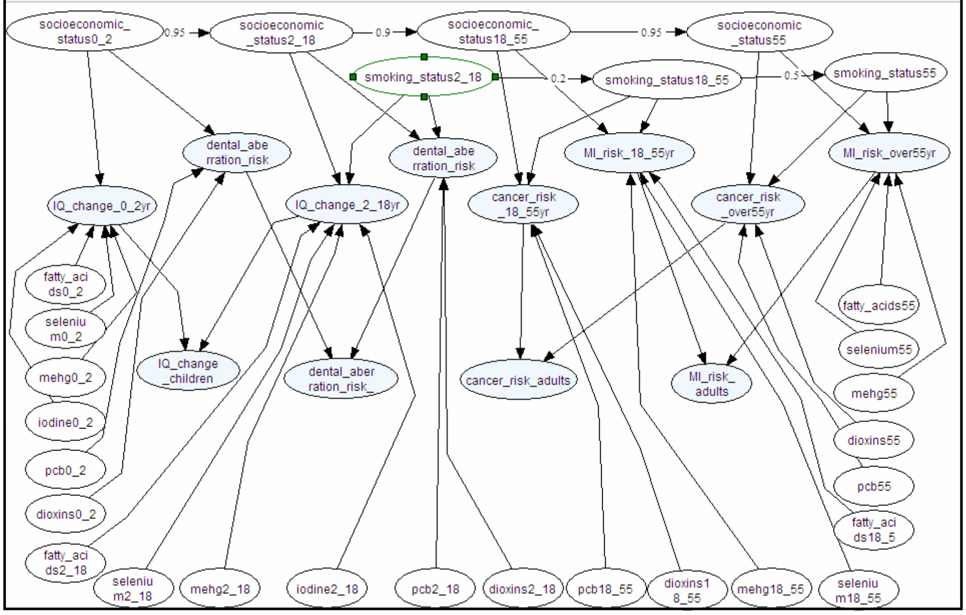
Fish Study



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- **Hope: overall model can:**
  - Focus data collection
  - Help us think about interactions
  - Help us think about Benefits as well as Risks

- **Non-Parametric continuous Bayesian Belief Nets can provide modeling platform**

Example Questions

“ Suppose that the baseline lifetime probability of developing cancer is pC_0. If the yearly intake of dioxins and furans is doubled (relative to baseline) and other variables remain unchanged, what are the 5%, 50% and 95% quantiles of your subjective probability distribution for the percent change in the probability of cancer in the remaining lifetime, i.e, the number *z* such that *Prob. Cancer in Remaining Life* = $pC_0 + z \times pC_0$?”

Suppose that the baseline lifetime probability of developing cancer is pC_0. If the yearly intake of dioxins and furans is doubled (relative to baseline) ***and also*** the the yearly intake of nicotine is doubled (relative to baseline), other variables at the baseline level, what are the 5%, 50% and 95% quantiles of your subjective probability distribution for the percent change in the probability of cancer in the remaining lifetime, i.e, the number z such that Prob. Cancer in Remaining Life = $pC_0 + z \times pC_0$?”