Gannets victim to spillage of lubricating oil and dodecylphenol in the North Sea, winter 1990

Jan van Genten slachtoffer van lozing van smeerolie en dodecylphenol in de Noordzee, winter 1990

During the first three weeks of December 1990, about thirty Gannets *Sula bassana* washed ashore on the Frisian islands Vlieland, Terschelling, and Ameland. The birds were covered with a sticky and oil-like substance. Some of the sick birds were taken to the bird rehabilitation centre at Anjum (Friesland). While cleaning the Gannets, personnel suffered from irritation of the mucous membranes of the eyes and the upper respiratory tract. All hospitalized birds died within a week.

On the eastern part of Terschelling, one day after finding the first sick Gannets, about 30 km of beach appeared to be polluted with a substance resembling that on the birds. Chemical examinations at the Governmental Institute for Integral Fresh Water Management and Waste Water Treatment (RIZA) of samples from feathers revealed the presence of lubricating oil. Since this compound cannot induce irritation of mucous membranes as shown by the bird hospital personnel, additional examinations were done at the Central Veterinary Institute (CDI-DLO). Chemical analyses were carried out by gas liquid chromatography with mass selective detection (GC/MS). In methanol extracts from two feather samples, the presence of dodecylphenol was demonstrated.

Dodecylphenol is a toxic compound that - like other phenols - irritates eyes, skin, respiratory tract and alimentary canal. After resorption it initially stimulates and later on depresses the central nervous system. In cases of severe poisoning, death is caused by respiratory or heart failure. Lubricating oil only exhibits a laxative effect after resorption. Both dodecylphenol and lubricating oil are lipophilic and therefore adhere easily to feathers, affecting heat insulation and water repellancy of exposed birds. In severe cases, these effects result in death from hypothermia or exhaustion. It was concluded that dodecylphenol probably had markedly contributed to the sickness and mortality among the Gannets.

In the form of calciumdodecylphenolate, dodecylphenol is used as an additive in lubricating oil for ship engines. In the presence of moisture, it breaks down to dodecylphenol and calciumhydroxide (Timm & Dahlmann 1991). Hence, it is suggested that lubricating oil and dodecylphenol were discharged from a ship in December 1990. In the North Sea as well as in the Wadden Sea oils, together with phenolic compounds (e.g. nonylphenol, dodecylphenol), were involved several times in cases of seabird mortality the last few years (Camphuysen 1991, Zoun *et al.* 1991). Therefore, it seemed very important that efforts should be undertaken in order to diminish spillage of these compounds. For this purpose, we contacted the North Sea Directorate of the Ministry of Trasport, Public Works and Water Management.

Samenvatting In december 1990 trad sterfte op onder een dertigtal Jan van Genten

Sula bassana *in de Noordzee, in het gebied ten noorden van de Nederlandse waddeneilanden. Aan de hand van een gezamenlijk onderzoek door het Rijksinstituut voor Integraal Zoetwaterbeheer en Afvalwaterbehandeling (RIZA) en het DLO-Centraal Diergeneeskundig Instituut (CDI-DLO) kwam vast te staan dat de oorzaak was gelegen in lozing door een schip van een mengsel van smeerolie en het additief dodecylphenol. Bij zeevogels leidt uitwendig contact met deze stoffen tot het optreden van fysische effecten in de vorm van vermindering van warmteisolatie en het drijfvermogen. Dodecylphenol werkt daarnaast locaal prikkelend op de slijmvliezen van de ogen, de huid en de ademhalingsorganen. Na resorptie vertonen beide stoffen een locaal prikkelende werking op de slijmvliezen van het maagdarmkanaal; dodecylphenol werkt tevens in op het centraal zenuwstelsel, aanvankelijk stimulerend en later remmend. Lozingen van olie te zamen met fenolachtige stoffen (nonylphenol, dodecylphenol) hebben de laatste jaren reeds meerdere malen geleid tot sterfte van vogels in zowel de Noordzee als de Waddenzee. Daarom is het van belang dat porgingen worden ondernomen om deze lozingen terug te dringen. Hiertoe is contact opgenomen met de Directie Noordzee van Rijkswaterstaat.*

Camphuysen C.J. 1991. Vergelijkend onderzoek naar voor vogelsterfte verantwoordelijke typen olie in de zuidelijke Noordzee: resultaten voorjaar 1990. Sula 5(1): 26-29.

Timm D. & Dahlmann G. 1991. Investigations into the source of non-mineral oils in the feathers of seabirds. Sula 5(special issue): 15-18.

Zoun P.E.F., Baars A.J. & Boshuizen R.S. 1991. A case of seabird mortality in the Netherlands during the winter of 1988/1989 caused by spillage of Nonylphenol and vegetable oils. Sula 5(special issue): 47-48.

P.E.F. Zoun & R.S. Boshuizen, DLO-Central Veterinary Institute, Department of Biochemistry and Toxicology. Ministry of Agriculture, Nature Management and Fisheries. P.O. Box 65, 8200 AB Lelystad.