formula: %T = transformants counted on minimal agar/ number of exposed cells (colonies) counted on lysine agar X 100.

High level frequencies of transformation of the lysine autotroph to prototrophy ranged from 7–12% (Table). The controls in the experiments performed were always negative[9,10].

Zusammenfassung. Die Kompetenz für intraspezifische Transformation bei *Neisseria catarrhalis* wird nachgewiesen. Als genetischer Marker wird Lys⁻ gewählt und hohe Frequenzen von Protrotophen festgestellt.

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Dietary Sterols: Role in Larval Feeding Behaviour of the Southwestern Corn Borer, *Diatraea grandiosella*

Although the effect of dietary sterols has been examined in many insects, research has focused primarily on sterol indispensability, utilization, and metabolism[1,2]. Studies examining the effect of sterols on feeding behaviour have not kept pace[3,4]. This paucity of behavioural data is unfortunate since some growth effects caused by dietary sterols may have been due to feeding stimulation or deterrency rather than to lesions in sterol absorption or metabolism. For this reason the present study examined the effect of sterols and sterol esters on feeding behaviour of the southwestern corn borer, *Diatraea grandiosella* Dyar. Since nutritional experiments have already shown that the structure of dietary sterols influences the growth rate of this corn borer[5], the present experiments were designed to differentiate behavioural from nutritional responses to sterols.

Methods. A culture of *D. grandiosella* was reared on a meridic diet[6], and newly-hatched first stage larvae were used for the experiments. The control diet was a simplified version of the rearing medium and contained (in g): casein (vitamin-free) 3.3; cellulose powder 2.8; agar (Bacto) 2.6; glucose 1.0; and water 90.3. Sterols (0.18 g) or sterol esters (0.2–0.32 g) were incorporated into the test diets at the expense of water. Each medium was prepared by mixing the boiling agar solution with the dry components and was then dispensed into Petri dishes. Cylinders (13 mm ⌀) cut from the gel weighed about 1.4 g each and served as the feeding stations in the bioassay.

A 24 h bioassay examined what effect the test compounds had on the maintenance of larval feeding rather than on initial attraction or biting responses[7,8]. Plastic Petri dishes (13 × 85 mm) served as the test arenas and contained 2 control and 2 test stations with like stations diametrically opposite to each other and 25 mm from the centre. 50 first stage larvae were placed in the centre of each arena and incubated for 24 h at 30 °C in darkness. Each experiment was replicated 4 times. Following incubation the number of larvae on each test and control station was recorded. About 70% of the larvae were usually found at the feeding stations. The results are presented as the percent of larvae on the control or test stations in relation to the total number feeding, ignoring the few larvae which did not establish during the incubation period. The data were analyzed using Student's *t*-test to determine statistical differences[9]. Preliminary experiments showed that larvae were randomly distributed among feeding stations in 'no-choice' situations and no larval-larval interactions were detected.

Results and Discussion. The results (Table) show that cholesterol, 7-dehydrocholesterol, and ergosterol had neutral effects on larval feeding behaviour. The first two sterols have already been shown to support larval growth while larvae died when ergosterol was the sole dietary sterol[5]. Since all these sterols had a neutral effect on feeding behaviour the larval mortality on the ergosterol diet can now be attributed to an inability to absorb or metabolize ergosterol to cholesterol rather than to any feeding deterrency and starvation. *D. grandiosella* may well lack a C_{24} demethylating enzyme required to convert this sterol to cholesterol.

The Table also shows that the 3 cholesterol esters tested were feeding deterrents. Nutritional experiments have already shown that diets supplemented with these esters resulted in low larval growth rates[10]. It is now apparent that this poor growth resulted from feeding deterrency and a low rate of food consumption rather than to any lesion in the absorption or metabolism of the dietary cholesterol esters. Since the feeding deterrency was obtained with 3 different acid moieties (acetate, myristate, oleate) it appears that a substituted 3 hydroxyl group adversely affects the insect's sensory mechanisms. Similar results were obtained with β-sitosterol acetate. In this case substitution of the hydroxyl group transformed the molecule from a feeding stimulant into one which had a neutral effect on feeding behaviour. It may therefore be concluded that the 3 hydroxyl is one crucial position controlling the effect of sterol molecules on feeding behaviour.

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Effect of dietary sterols and sterol esters on the maintenance of feeding of first stage larvae of the southwestern corn borer

Choice Available	Larval Establishment (%)	Choice Available	Larval Establishment (%)
Control (sterol-free)	55	Control	69
Cholesterol	45	Cholesterol oleate	31 [a]
Control	50	Control	38
7-Dehydrocholerol	50	Stigmasterol	62 [b]
Control	55	Control	40
Ergosterol	45	β-Sitosterol	60 [b]
Control	65	Control	53
Cholesterol acetate	35[a]	β-Sitosterol acetate	57
Control	65		
Cholesterol myristate	35[a]		

[a] Difference significant at the 0.01 probability level. [b] Difference significant at the 0.05 probability level.

The two plant sterols proved to be feeding stimulants since significantly more larvae established on diets containing stigmasterol or β-sitosterol than on the sterol-free controls. These data indicate that these plant sterols permitted higher larval growth rates than cholesterol in earlier nutritional experiments because they stimulated larval feeding[5]. Although *D. grandiosella* must have the capacity to metabolize both of these sterols to cholesterol[2], β-sitosterol may be converted at a higher rate than stigmasterol since larvae grew better on diets containing the former than the latter. Beta-sitosterol and stigmasterol no doubt stimulate the southwestern corn borer to feed on its host plants and may be necessary feeding stimulants for many plant feeding insects[11]. These sterols, however, probably do not function in host plant selection because they are widely distributed among green plants[12,13].

Zusammenfassung. Eine Beziehung zwischen chemischer Struktur und biologischer Aktivität wurde im Einfluss diätetischer Sterole auf das Fütterungsverhalten frisch geschlüpfter Larven von *Diatraea grandiosella* gefunden. Die experimentellen Resultate zeigen, dass die C_{29}-Pflanzensterole, β-Sitosterol und Stigmasterol, die Futteraufnahme anregen, Cholesterol, 7-Dehydrocholesterol, Ergosterol und β-Sitosterolazetat sich in dieser Hinsicht neutral verhalten und Cholesterol-Ester die Futteraufnahme hemmen.

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Size of *Trichinella spiralis* (Nematoda) Muscle Cysts in the Rat, Mouse and Guinea-Pig

The life cycle of *Trichinella spiralis* and its many parameters in laboratory animals has been known for many years and comprehensively reviewed[1,2]. There, however, have been only a few reports[1,3–10] on the size of the cysts in skeletal muscle; indicating an incompleteness of life cycle information. Nevertheless, this cyst size, along with the size of other stages in the life cycle, are often and importantly used as a criterion in the efficacy of *T. spiralis* anthelminthics[11]. The aim, therefore, of this paper is to investigate, describe, and establish definite parameters concerning the in vivo size of the cysts in rat, mouse, and guinea-pig skeletal muscle.

Materials and methods. 10 Sprague-Drawley male albino rats, 10 CFW strain male mice, and 10 random-bred male guinea-pigs were used. They were maintained individually in polycarbonate cages. Purina Laboratory Chow and fresh water were provided *ad libitum*. At the age of 42 days, all animals were inoculated with 1000 ± 50 infective larvae by stomach tube. At the end of 60 days postinoculation, animals were killed with ether fumes and their diaphragms excised. The cysts were teased out of the muscle fibers onto microscope slides. Measurements, in mm, were made at $\times 450$ using a micromanipulator and ocular micrometer. 500 measurements were made/animal host (50/individual). A 2-factor analysis of vari-

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