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acid in feed only and the combination of propionic acid in both litter and feed. A total of 336 Broad Breasted White male turkeys were randomly assigned among 12 pens. Each treatment was replicated three times with 28 birds per pen.

There were no significant differences in mortality, weight gains or feed efficiencies among treatments. The average levels of aflatoxin found in litter of the control pens ranged from 2.42 to 3.63 times greater than that of pens receiving propionic acid. The incidence of breast blisters requiring trimming at the processing plant was reduced by 12 to 30 percent, depending upon the treatment method used, where propionic acid was the active ingredient of the mold inhibitor compound.

DELAYED EFFECTS OF AFLATOXIN ON EGG PRODUCTION

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The effect on laying hens of short term doses of dietary aflatoxin was investigated by incorporating 20 p.p.m. of aflatoxin into a commercial ration and feeding it for seven days to White Leghorn hens selected for uniformity of age, size, and egg production. During this feeding period egg production was not affected although plasma calcium, protein, cholesterol, and triglycerides declined starting the third day of feeding aflatoxin. After seven days, these layers were returned to the control ration. After three days on the control ration, the plasma calcium, protein, cholesterol, and triglycerides began to increase and reached control values the tenth day of recovery. Egg production rate began to decline on the third day of recovery from aflatoxin feeding and reached a rate of 35 percent on the seventh day. Egg production did not return to the control value of 70 percent until 23 days after the layers were removed from the aflatoxin diet. These data suggest that the aflatoxin impairs egg production by reducing synthesis and transport of yolk constituents and that these reduced amounts of precursors are channeled preferentially to ova already committed to maturation.

SPECIES DIFFERENCES IN POLYCHLORINATED BIPHENYLS (PCB) RESPONSE

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Diets containing equal amounts of Aroclor 1242 contaminated fish meal were fed to chicks and poults from day-old to four weeks. Four levels from 0 to 10% of contaminated fish meal having 1500 p.p.m. PCB's were used, supplying 0, 38, 75, and 150 p.p.m. PCB's in the respective diets.

Chicks performed as follows: controls weighed 541g. and had 4% mortality, 38 p.p.m. PCB weighed 518 and had 2% mortality, 75 p.p.m., weighed 460g. and had 21% mortality, and 150 p.p.m. weighed 375 and had 75% mortality. Both 75 and 150 p.p.m diets produced edema and other lesions attributed to PCB toxicity.

The poults, receiving the same treatments, weighed 442g., 443g., 443g., and 444g. respectively. Mortality was heavy due to a possible bacterial infection early in the brooding. No mortality was attributed to PCB toxicity. Post mortem showed no edema, pericarditis, or other lesions due to PCB toxicity. A second trial was run on poults using the 0 and 150 p.p.m. levels. The results were almost identical. Mortality was still high but again not due to PCB toxicity. The 0 treatment weighed 416g. and the 150 p.p.m. treatment 426g. There were no apparent symptoms or lesions in these poults.

THE EFFECT OF DIETARY POLYCHLORINATED BIPHENYLS OF SOME CARDIOVASCULAR PARAMETERS IN CHICKENS

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Polychlorinated biphenyls (PCB's), compounds known to be accidental contaminants of poultry, may cause edema and hydropericardium. Little information is available on the effects of different polychlorinated biphenyls on cardiovascular parameters in chickens. Day-old White Leghorn cockerels were fed 0, 50, 100 and 150 p.p.m. of Aroclors® 1221, 1242, 1254 and 1260 until they were 8 or 9 weeks of age, at which time systemic arterial blood pressure, heart rate, hematocrit, hemoglobin, total erythrocyte count and arterial blood pH were measured. The birds were killed; heart, liver, spleen weights and pericardial fluid volume were recorded.

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Heart rate was significantly reduced by Aroclors 1242 and 1254 at ≥ 100 p.p.m. and was not altered by 150 p.p.m. Aroclor 1221 or 1260. Mean blood pressure was unaffected by any treatment used.

Hemoglobin, hematocrit and total erythrocyte count were found to be significantly decreased by Aroclors 1242 and 1254 at ≥ 50 p.p.m. These same parameters were not affected by Aroclor 1221 or 1260 at any level used. Pericardial fluid volume was increased at ≥ 50 p.p.m. of Aroclors 1242 and 1254 and unaffected by 1221 and 1260.

* Registered trademark by Monsanto, St. Louis, Missouri for polychlorinated biphenyl compounds containing 21, 42, 54 and 60 percent chlorine, respectively.

THE METABOLISM AND TOXICOLOGY OF ^{14}C AFLATOXINS IN LAYING HENS

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Sodium acetate -1-^{14}C labeled aflatoxins were produced by growing *Aspergillus flavus* strain NRRL-2999. The purified radioactive aflatoxins were further checked for radioactive purity by the thin layer chromatography. The specific activity was 0.03 μCi/mM of B_1. A single 0.27 μCi. oral dose of aflatoxins was administered to laying White Leghorn pullets. The radioactivity of various tissues at 1, 4, and 7 days after the administrations of the dose was determined.

70.16% of ^{14}C-activity was recovered from the excrement after seven days of initial administration of aflatoxins. The highest activity was found in bile followed by liver and reproductive organs. The digestive tract had fairly high specific activities after 1 day, but it was higher in crop and gizzard contents. All the parts of egg showed ^{14}C-activity. Various other edible parts showed varied amounts of ^{14}C-aflatoxins or its metabolites, or both.

The liver, crop, gizzard, and fecal contents were toxic to duckling.

SOME TOXIC EFFECTS OF FEEDING MOLD INFESTED CORN TO BROILER CHICKS

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Three feeding trials were conducted to determine the effect of diets incorporating heat-treated, mold infested corn on chick performance. Treatments included complete replacement of corn in the diet by corn incubated with mold isolates (1 *Aspergillus sp.* and 3 *Fusarium sp.*) for periods of 6 to 8 weeks.

Chicks fed experimental diets showed a significant reduction in weight gain ($P < .01$) and, in feed efficiency ($P < .05$) when infested corn that had been incubated for 8 weeks were fed. Feed efficiency was significantly ($P < .05$) decreased with the diet containing corn incubated for 6 weeks with *Aspergillus sp.* Percentage of dry matter in the excreta was significantly ($P < .05$) increased when chicks received the infested corn diets.

Treated chicks exhibited (as early as 12 days of age) a severe leg deformity characterized by a bowing outward or a slanting inward of the legs giving the chicks either a "cowboy" or a "knock-kneed" appearance. No consistent difference in tibia ash was observed between treated and control chicks. Treated chicks had caeca distended with brown material, mild enteritis and lesions of the sciatic nerves.

DEPLETION OF POLYCHLORINATED BIPHENYLS (PCB'S) FROM LAYING HENS*

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A class of compounds called polychlorinated biphenyls (PCB's) have been involved in several industrial accidents in recent months. This has resulted in feed ingredients contamination which has cost the poultry industry millions of dollars in condemned products and live birds.

To determine a method to deplete PCB's from contaminated layers, about 26,000 Single Comb White Leghorn (S.C.W.L.) breeder hens were maintained in floor pens with the feed removed for 14 days. The PCB concentration was 20.4 p.p.m. and 2.5 p.p.m. in adipose tissue and eggs respectively at initiation of the study. Hatchability at this time was less than 0.5%. After 14 days without feed, as was expected, egg production had ceased but PCB concentration of adipose tissue had increased to 38.4 p.p.m.

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During this same period about 40,000 S.C.W.L. breeders were maintained in floor pens and fed a standard commercial breeder ration. Adipose tissue and egg PCB concentration was monitored weekly. PCB concentrations (p.p.m.) from adipose tissue were 20.4, 16.6, 12.2, 9.3 and 7.1 for a period of 0, 2, 4, 6 and 8 weeks. In eggs the PCB concentrations (p.p.m.) were 2.3, 1.7, 1.2, 1.1 and 0.72 for a period of 0, 2, 4, 6 and 8 weeks.

When PCB concentration in adipose tissue and eggs reached 14.4 p.p.m. and 1.3 p.p.m. respectively, 85% hatchability was attained and increased to 92% as adipose tissue and egg PCB concentration decreased.

EFFECTS OF FUSARIUM MYCOTOXINS ON LAYING HENS

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Two experiments were conducted to study the effect of mycotoxins produced by *F. roseum, F. tricinctum* and *F. oxysporum* on laying hens. Corn invaded by these fungus species were included in the diets at levels indicated and fed 42 and 49 days to each of three breeds of hens, (S.C.W.L., R.I.R. and N.H.) in the one experiment and to S.C.W.L. and R.I.R. hens in a second.

In experiment 1, *F. roseum* (10% of diet, providing 500 p.p.m. F-2) had no detrimental effect on performance or egg quality. Corn invaded by *F. oxysporum* and *F. tricinctum* (5%) caused a marked decrease in feed intake and subsequent body weight loss for all 3 breeds. Egg production of all birds fed *F. oxysporum* ceased in one week as did production of R.I.R. and N.H. hens fed *F. tricinctum* while production of S.C.W.L. continued to be normal except for one bird. However, serum GOT was elevated in N.H. hens fed *F. tricinctum*.

In a 2nd experiment, *F. tricinctum* and *F. oxysporum* at 1 or 3% of the diet again reduced feed intake and egg production dropped with R.I.R. hens. *F. tricinctum* was the most potent toxin source and birds fed 3% *F. tricinctum* exhibited a high incidence of mouth and tongue lesions.

PHYSIOLOGICAL STRESS CAUSED BY AFLATOXIN IN CHICKENS

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Aflatoxin causes a reduction in the size of the bursa of Fabricius, immunodepression, increased numbers of circulating granulocytes and decreased numbers of agranulocytes, and decreased levels of serum lipids. These changes are characteristic of physiological stress which is mediated by the adrenal glands. The present study was conducted to determine the effect of dietary aflatoxin on the growth and function of the adrenals. Another objective was to access the effect of aflatoxin on the levels of serum protein and glucose and body temperature which also are altered during stress. Male chicks were fed graded doses of dietary aflatoxin from hatching until termination of the experiment at three weeks of age. The adrenals were analyzed to determine the concentrations of cholesterol and corticosterone. In similar experiments body temperature was determined at four day intervals throughout the experimental period and the levels of serum protein and glucose were determined after three weeks of aflatoxin treatment. A highly significant ($P < 0.01$) and dose-related reduction in the levels of adrenal cholesterol and corticosterone was noted. Concomitantly, the relative weights of the adrenals were found to be increased by aflatoxin. The levels of serum protein and glucose, as well as body temperature, were lowered by aflatoxin. These results suggest that aflatoxin causes classic physiological stress in chickens.

AFLATOXIN AND VITAMIN NUTRITION

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Previous studies on vitamin nutrition during aflatoxicosis have demonstrated that the addition of extra vitamins to a sufficient diet has little if any effect on the disease. The present study investigated the interrelationships between aflatoxin and vitamin deficiencies. Factorial experiments for the presence and absence of dietary aflatoxin (0.625 p.p.m.) and graded levels of riboflavin revealed a negative interaction of aflatoxin and riboflavin deficiency on growth rate. Incidence of curled-toe paralysis which was less than 10 percent, even when very deficient diets were fed, was not altered

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