

Table 1. (Continued) Anticoccidial drugs used in the poultry industry.

Chemical group (approx. dose, ppm ^a); relevant information	Non proprietary name, *brand name (manu- facturer, company); other information	Characteristics ^b and miscellaneous comments
*** (170 → 100+5+60 +5)	amprolium (20 parts)+ ethopabate (1 part)+ sulfaquinoxaline (12 parts)+ pyrimethamine (1 part) ***Pancoxin Plus (MSD)	outside the product license, amprolium and Amprolmix (other combinations may be discontinued) has been applied for control and treatment of coccidiosis in various animals such as pheasant (not active against all <i>Eimeria</i> spp.), sheep and cattle (medicated feed: amprolium/ethopabate: 250/16 ppm), sows (to control disease in suckling pigs pre and post farrowing: see latter concentrations), or rabbits (medicated feed, amprolium plus ethopabate:125+8 ppm to control intestinal <i>Eimeria</i> spp., amprolium is ineffective against hepatic coccidiosis in rabbits); in young ducklings tolerance of Amprolmix appears to be some what erratic and its use is best avoided
(125)	beclotiamine *Coccidien (Sankyo)- dimethalium	there are several related thiamine analogues which are similar in their anticoccidial activity and mode of action to amprolium; beclotiamine or dimethalium have never been used extensively since they have no advantage over amprolium and have common drug resistance problems
QUINAZOLINONES		
(2-3) ^{c11} 1976	^{c11} halofuginone (hydrobromide) *Stenorol (Intervet)	feed additive for prevention of coccidiosis is licensed for use in broiler chickens, replacement pullets (up to 16 weeks of age) and turkey poults (up to 12 weeks of age) and usually used in shuttle (or rotation) programs with one of the ionophores; it has broad spectrum of activity against all pathogenic coccidia of chickens and turkeys, and affects asexual stages, particularly during first-generation schizogony maturation; action of drug is coccidiocidal/coccidiostatic but in case of <i>E. acervulina</i> not as strong as with other species; drug resistance may occur if drug is used for too long periods in continuous (straight) medication programs; it is well tolerated at 3 ppm in birds licensed; however, in anseriformes (ducks, geese, swans), water fowl, guinea fowls, partridges or other game birds, and rabbits 3 ppm may cause serious side effects and mortality after continuous medication; mode of action of halofuginone in coccidia seems to be unknown; in skin fibroblasts of chickens it interferes with collagen synthesis thereby decreasing skin strength and increasing incidences of skin tears during processing; shuttle programs in which halofuginone is included in grower feed seems to maintain skin integrity in broilers
unpalatable at recommended concentrations for ducks, geese, guinea fowl, partridge, quail and rabbits; this drawback may cause reduction in feed intake and/ or toxic reactions, mortality	originally derived from a plant extract (<i>Dichroa febrifuga</i> Lour); febrifugine had an antimalarial and anticoccidial effect but a narrow safety margin; synthetic variations previously made by American Cyanamid led to halofuginone	
Guanidine derivatives (30-36, in birds) (50-66, in rabbit) ^{c12} 1972	^{c12} robenidine *Cycostat 66 (Europe) *Robenz (USA) (earlier Cyanamid; now Roche)	feed additive licensed for prevention of coccidiosis in broiler chickens, turkeys and rabbits for meat production; has broad-spectrum activity (rabbits intestinal <i>Eimeria</i> spp. only); it is most effective against late developing stages of first and second -generation schizonts, and possibly it exhibits some activity against gamonts (sexual stages); its action is first coccidiostatic and then coccidiocidal; unexpected quick development of drug resistance on poultry farms in USA and Canada within a year of its introduction has limited its use; drug is believed to interfere with energy metabolism by inhibition of respiratory chain phosphorylation and ATPase activity in rat liver mitochondria; other guanidine derivatives which lack anticoccidial activity also share this inhibitory activity on oxidative phosphorylation process
if not withdrawn in prescribed time (5 days), or used at higher concentrations drug produces an unpleasant (medical) flavor in edible broiler tissue or eggs of layers		