5.9 FENPYROXIMATE (193)

RESIDUE AND ANALYTICAL ASPECTS

The current Meeting identified an error in a table in the 2017 evaluation of fenpyroximate that was relied upon is setting the residue definitions for livestock commodities by the 2017 JMPR. Columns in Table 39 on lactating goat metabolism were incorrectly labelled leading the 2017 JMPR to include (*E*)-4-{[(1,3-dimethyl-5-(4-hydroxyphenoxy)pyrazol-4-yl]methyleneaminooxymethyl}benzoic acid (M-5) and its conjugates in the residue definition for risk assessment for animal commodities. The current Meeting re-evaluated the lactating goat metabolism studies and the residue definitions for livestock commodities.

In goats, the residue profile varied by matrix. The Fen-OH metabolite was consistently observed as a major residue in milk, muscle and fat (27% TRR milk, 74% TRR muscle, 35% TRR fat) and detected in liver and kidney (5% TRR liver, and 3% TRR kidney). Additional residues observed across multiple matrices at greater than 10% TRR were fenpyroximate (26% TRR milk, 36% TRR fat), N-desmethyl M-3 (20% TRR liver, 26% TRR kidney), M-3 (33% TRR muscle, 14% TRR fat, 59% TRR liver, 47% TRR kidney) and M-21 (26–55% TRR in milk). A QuEChERS method was validated for analysis of fenpyroximate and M-3 in milk, fat, muscle, and offal. Based on structural similarities between fenpyroximate, M-3 and Fen-OH, the Meeting noted that the method is likely to be suitable for analysis of Fen-OH. The Meeting confirmed that the sum of fenpyroximate, Fen-OH and M-3, expressed as fenpyroximate is a suitable marker for compliance in livestock commodities.

In addition to the residues for compliance, dietary exposure from consumption of livestock commodities may occur for the sum of M-5 and M-5-glucuronide for liver (6% TRR, 0.065 mg eq/kg) and kidney (10% TRR, 0.213 mg eq/kg), for M-21 in milk (55% TRR, 0.015 mg eq/kg), and M-22 in liver and kidney (4–9% TRR, 0.053–0.14 mg eq/kg). The toxicity of M-5, M-5- glucuronide, M-21 and M-22 are covered by parent fenpyroximate. M-5 and its conjugates were only detected in liver and kidney and only at ≤ 10% TRR. As such M-5 and its conjugates are expected to make a negligible contribution to overall long-term dietary exposure. Since M-21, M-22 and desmethyl-M3 were not detected in the dairy cow feeding study, the Meeting decided that they do not need to be included for assessing dietary exposure. There was no evidence in the goat metabolism study of significant levels of *Z*-isomers and it is not necessary to include *Z*-isomers in the residue definition. The Meeting decided that definition for dietary risk assessment should be revised to the sum of fenpyroximate, Fen-OH and M-3, expressed as fenpyroximate, in livestock commodities.

In summary, the fenpyroximate residue definition, for compliance with the MRL and dietary risk assessment, for animal commodities is: *sum of fenpyroximate, 2-hydroxymethyl-2-propyl (E)-4-[(1,3-dimethyl-5- phenoxypyrazol-4-yl)-methylenaminooxymethyl]benzoate (Fen-OH), and (E)-4-[(1,3-dimethyl-5-phenoxypyrazol-4-yl)methyleneaminooxymethyl]benzoic acid (M-3), expressed as fenpyroximate.*

Maximum residue levels for livestock commodities needed to be revisted in light of the amended residue definitions. The dietary burdens are the same as reported by the 2017 JMPR.

Animal commodity maximum residue levels

The calculation used to estimate highest total residues for use in estimating maximum residue levels, STMR and HR values for cattle matrices is shown below.

	Feed level (ppm) for milk residues	Residues (mg/kg) in milk	Feed level (ppm) for tissue residues	Residues (mg/kg)			
				Muscle	Liver	Kidney	Fat
maximum residue level beef or dairy cattle							
Feeding study [a]	3	0.005	3	0.017	0.42	0.36	0.083
	10	0.013	10	0.059	0.91	0.459	0.169
Dietary burden and high residue	3.503	0.0056	3.503	0.02	0.455	0.367	0.089
STMR beef or dairy cattle							
Feeding study [b]	1	0	1	< 0.01	0.19	0.20	0.015
	3	0.005	3	0.015	0.37	0.29	0.063
Dietary burden and median residue	1.595	0.0015	1.595	0.011	0.247	0.229	0.029

[a] Highest residues for tissues and mean residues for milk

[b] Mean residues for tissues and milk

For liver and kidney, the compounds measured in the feeding study and reported as the residue were the sum of fenpyroximate and M-3 while the residue definition for dietary risk assessment also includes Fen-OH. The lactating goat metabolism studies can be used to calculate scaling factors for conversion of residues measured as the sum of fenpyroximate and M-3 to the sum of fenpyroximate, Fen-OH and M-3. The scaling factors, calculated as the mean factors from the benzyl and pyrazole label experiments, are kidney 1.04 and liver 1.08. A conservative scaling factor of 1.1 is applied to the estimates for liver and kidney to give highest residues of 0.501 and 0.404 mg/kg for liver and kidney respectively and median residues of 0.272 and 0.252 mg/kg respectively.

The Meeting estimated a maximum residue level of 0.01 mg/kg for fenpyroximate for milk, of 0.1 mg/kg for mammalian meat (fat), of 0.5 mg/kg for edible offal (mammalian) and 0.1 mg/kg for mammalian fats confirming its previous recommendations. The Meeting estimated STMRs of 0.0015 mg/kg for milk, of 0.011 mg/kg for mammalian meat, 0.272 mg/kg for edible offal (mammalian) and 0.029 mg/kg for mammalian fat.

There were no changes to the conclusions of the dietary risk assessment. A corrigenda was prepared for the monograph.