

SiliaPrepX™

Ractopamine And Clenbuterol In Beef Cattle

Ractopamine and clenbuterol are β 2-agonist drugs used in veterinary medicine as a feed additive to promote growth of pigs and beef cattle. Ractopamine has been banned in many countries and European Union has prohibited the addition of clenbuterol in animal feed. Inversely to the ractopamine which can only be used for animals, clenbuterol can be prescribed as a bronchodilator for asthma patients but is not approved as an ingredient of any therapeutic drug by the US Food and Drug Administration.

Hence, a detection method is crucial to determine the presence of these compounds in meat. As it is a complex matrix, an efficient sample preparation method is required prior to any meat analysis, and to achieve this, SiliaPrepX WCX has proven its effectiveness.

LEARN MORE

about SiliaPrepX in our brochure
"Solutions for Sample Preparation".

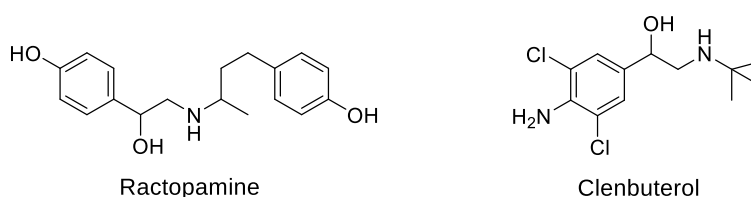


SILIAPREPX WCX CHARACTERISTICS

SiliaPrepX WCX is a polystyrene-divinylbenzene copolymer functionalized by a weak cation exchanger (*carboxylic acid*, pK_a 5), used to catch and release strong basic compounds ($pK_a > 10$).

SAMPLE PREPARATION

Figure 1: Ractopamine and clenbuterol structures



Extraction procedure

1. Add 2 g of meat, 8 mL of 0.2 M sodium acetate solution (pH 5.2), and 50 μ L of β 2-glucuronidase / arylsulfatase to a 50 mL tube.
2. Shake the tube for 15 minutes and incubate for 8 hours at 40°C.
3. Vortex the mixture for 30 seconds.
4. Add 4 mL of a H_3PO_4 3 % in acetonitrile solution.
5. Vortex the mixture for 30 seconds.
6. Centrifugate at 4,700 rpm for 10 minutes.
7. Withdraw 4 mL of the supernatant in a 50 mL tube.
8. Add 5 mL of perchloric acid solution 0.1 M and adjust the pH to 1.0 using a HCl solution.
9. Centrifugate at 4,700 rpm for 10 minutes.
10. Collect the supernatant and adjust the pH to 7.0 with a NaOH solution.

Table 1: Ractopamine and clenbuterol extraction using SiliaPrepX WCX cartridge


| Ractopamine and Clenbuterol Extraction Using SiliaPrepX WCX Cartridge | |
|---|---|
| Parameter | Value |
| CARTRIDGE | SiliaPrepX WCX, Polymer, 60 mg, 3 mL, 85 μ m, 60 Å |
| PART NUMBER | SPE-P0015-03BB |
| CONDITIONING STEP | 3 mL of methanol |
| EQUILIBRATION STEP | 3 mL of water |
| LOADING STEP | Pass the supernatant through the cartridge |
| WASHING STEP | 3 mL of water |
| ELUTION STEP | 3 mL of 4 % formic acid in methanol |
| RECONSTITUTION | Evaporation under a nitrogen stream (20 minutes at 40°C), reconstitution with 1 mL of water / methanol (65/35), and quantification by LC/MS |



HPLC ANALYSIS

The reconstituted sample was then analyzed by HPLC using a SiliaChrom dt C18 column. Recovery results are presented in Table 2.

Table 2: Ractopamine and clenbuterol recoveries

|  Ractopamine and Clenbuterol Recoveries | |
|--|--------------|
| Compound | Recovery (%) |
| Ractopamine | 91 |
| Clenbuterol | 92 |

CONCLUSION

SiliaPrepX WCX cartridges allowed an efficient extraction of ractopamine and clenbuterol in meat prior to their HPLC analysis.

