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On the bijectivity of the antipode of some infinite quantum groups.

The bijectivity of the antipode of an infinite dimensional Hopf algebra (infinite quantum group) is an important and difficult problem. When it can be obtained, it is very useful as it implies left-right symmetry results for various classes of algebras (such as, for examples, left or right compact quantum groups). At the same time, examples where the antipode is not bijective are highly non-trivial. We present a new method for probing the bijectivity of the antipode, show how it recovers some known results and also use it to prove the bijectivity for one-sided co-serial Hopf algebras, and consequently obtain the left-right symmetry of this concept. We mention some open questions regarding non-commutative Noetherian algebraic group schemes (Noetherian Hopf algebras), which motivated this work and to which future applications might be possible. (Received January 29, 2019)